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## CONTENTS

PAGE

North to Everest:
I. Eastern Nepal, 1950 . . . . . *Eliazbeth S. Cowles* 1
II. South Face of Mount Everest . . *Charles S. Houston* 12
Up Yerupajá:
I. . . . . *W. V. Graham Matthews* 22
II. . . . . *David Harrah* 25
New Routes on Mount Waddington . . *Richard C. Houston* 33
The First Ascent of Mount Erasmus . . . *John C. Oberlin* 45
A Challenge on Mount Adamant *Andrew John Kauffman, 2nd* 52
The North Wall of the Grand . . . . . *Ray Garner* 61
East Face of Thor Peak . . . . . *Richard Pownall* 71
An Ascent of the Watzmann Ostwand . . *Richard N. Meyer* 78
Operation Operation . . . . . *Weldon F. Heald* 86
Belaying:
Practical Belaying . . . . . *Hassler Whitney* 90
Belaying on Snow and Ice . . . . . *Fred Beckey* 97
American Alpine Club Research Fund:
15. Glaciers of the Gannett-Fremont Peak Area, Wyoming . . . . . *Mark F. Meier* 109
16. The Juneau Ice Field, Alaska, 1948-51 . . . . . *Maynard M. Miller* 113
17. Dirt Band Project . . . . . *Joel E. Fisher* 118
Discoveries in Alaska (1896) . . . . . *W. A. Dickey* 124
Proceedings of the Club:
Secretary's Annual Report . . . . . 134
Annual Meeting and Dinner . . . . . 135
Report of the Librarian . . . . . 141
In Memoriam . . . . . 144
Book Reviews . . . . . 150
Various Notes . . . . . 166

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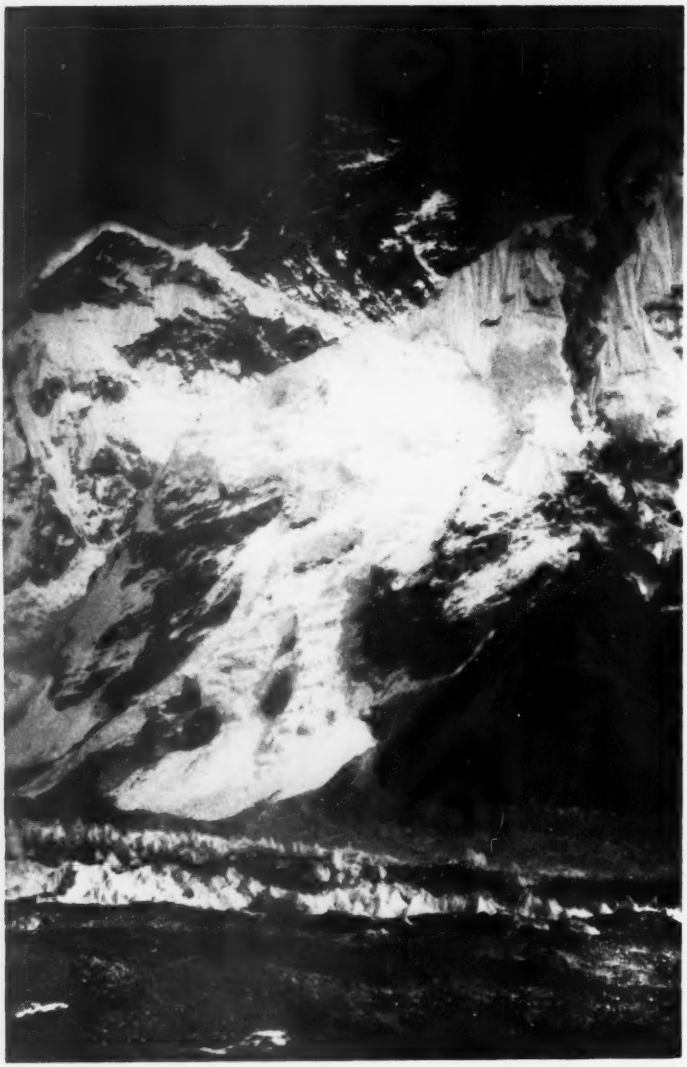

*Photo, H. W. Tilman*

SUMMIT OF EVEREST FROM WESTERN SIDE OF KHOMBU GLACIER

The first and second steps on the conventional northeast route are visible on the left-hand skyline

THE

AMERICAN ALPINE JOURNAL

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# North to Everest

## I. EASTERN NEPAL, 1950

ELIZABETH S. COWLES

IT was a lucky thing for all of us that the request Oscar Houston made in 1949 for permission to visit Katmandu and the main valley of Nepal had not been granted. In the interval between that year and the next, the interesting possibility of a trip into eastern Nepal came to his attention. For the first time in history it appeared likely that official Nepalese approval might be forthcoming for a small expedition to the virtually unknown area south of Mount Everest. Native trails could be followed northward from the Indian border right up to the peak itself. As Mr. Houston well knew, the possibilities of a climb from this side had never been measured. That clear and settled weather could be expected throughout the fall was another very attractive feature.

Since this sounded like the chance of a lifetime, Mr. Houston again applied for leave to enter Nepal, now including the eastern area in his request. And when His Highness the Maharajah Mohan Shumshere Jung Bahadur Rana graciously gave his approval in the spring of 1950, permission to visit the region south of Mount Everest was granted also. Mr. and Mrs. Houston arranged to go to Katmandu in early October, and plans began to take shape for an expedition into eastern Nepal immediately thereafter. I was very lucky to be included.

No one associated with the Houstons in these ventures will be found complaining about fate for years and years to come, if ever. For everybody concerned, the lucky chain of events continued. That Charles Houston was able to leave a busy medical practice in Exeter

and add his strength and experience to his father's undertaking was one tremendous break. Another was our running into H. W. Tilman in Katmandu and being able to persuade him to join us. Tilman, who probably knows more about the Himalayas than any man living, was just out from five months in the mountains of western Nepal. Obviously, he and Charley, friends from the Nanda Devi days, would be the ones to make the Everest reconnaissance toward which the whole trip was pointing. The fifth member of the party was Anderson Bakewell, who lives near Darjeeling. We were fortunate in having Andy on the spot, as he was able to do a great deal of advance work for the undertaking, gathering much essential information and personally selecting a fine group of Sherpa porters. I suppose it cannot exactly be called luck that the expedition was so splendidly equipped and supplied. All the endless details of planning were in Oscar Houston's hands, and they could not have been better cared for. But fate was kind in a lot of other ways: we were blessed in weather, in health, in congeniality and in the extraordinary kindness we were to meet everywhere. Everything combined ideally to give us an unforgettable experience.

On October 27th, Oscar, Charley (just off the plane from America) and I took the train at Delhi with some 1000 pounds of supplies and equipment. Our rendezvous with the others was to take place at Jogbani, the last railway stop in India south of the border of eastern Nepal. The little narrow-gauge train averaged, we figured, about ten miles an hour for the two and a half days we were on it—quite a slowdown in pace for Charley, who had not taken nearly that long coming from the U.S.A. Andy and Bill met us at Jogbani. Andy had brought the Sherpas with him from Darjeeling, including —to everyone's amazement—a lady Sherpa! She hailed from Namche Bazar, the last town before Everest, and was going home to see the folks. As we later found ourselves with lady coolies from time to time, this was really quite a coeducational enterprise! Gyaljen, the head Sherpa, was a veteran of two Everest expeditions and various others besides. Sarki, too, was an old hand and had gone up to Camp V on the French ascent of Annapurna during the summer. There were also Da Namgyal and Pa Nurbu, both experienced men, and another Gyaljen (no relation) who was scarcely more than a boy but very bright and promising. We met and liked them all, the Sherpette included.

Everyone spent the night of the 29th at a guest house of the big Jogbani jute mill, run by a man we had been lucky enough to meet in Katmandu two weeks before. His command car and lorry transported us and all our belongings across the 50-mile band of low country that lies between the border of Nepal and the hills where our trek was to begin. It took the whole of the morning to do this piece; a more punishing road could scarcely be imagined. Great confusion followed in Dharan, the last town before the hills, where Sahibs, Sherpas and baggage were all dumped about noon. It seemed impossible to distinguish between the people who were supposed to belong to us and the mob just hanging around to watch the fun. When the cumbersome caravan finally started, it was long after midday and steaming hot. What followed was a real chore. Nobody was used to anything: not the 16 coolies to their loads, nor the Sherpas to their new bosses, nor we to the trail, the heat or the public attention. This last was terrific! Being on one of the main north-south trade routes, we passed literally hundreds of heavily-laden coolies, their tapered straw baskets filled with salt, potatoes, cotton cloth, oranges and the like. If we paused for so much as a split second, the crowd would pile up around us six deep, and all traffic would come to a standstill. Nobody was unruly, nobody was impolite; they were just intensely curious and, one felt, considerably amused. Although the path was rough and steep, walking seemed easier on the whole than trusting oneself to one of the little Tibetan ponies that were—very temporarily, as it turned out—at our disposal. When, four days later, the ponies had to turn back for good at a place above the Arun, where the track became mere footholds on a cliff face, no one was sorry. The horse is out of place in Nepal. He has no job really. The universal load-carriers are the Nepalese himself, his wife and his children. Everybody carries in this country and seems to like it. One wonders what would happen to someone with fallen arches or a sacroiliac.

Our first camping place was a thrill. We had crossed, with much effort, the Siwalik Ridge and dropped halfway down the other side. The beautiful Tamur Valley lay below with its hills clustered around like stiff folds of blue-green taffeta. In the sky all along the north rose the icy summits of the Himalayas. Makalu was there and Chamlang and, far over to the east, Kangchenjunga—the only view that we were to have of it. We saw it at sunset, by moonlight, and

bathed in the early morning colors as the sun rose. This was worth coming a long distance for! Here, I remember, we came across our first Nepalese swing, an ingenious ferris-wheel contraption. These swings are very airy, always placed with an eye to the view and characteristic of a land whose people have a real gift for enjoying life.

Next morning we dropped to the Tamur River, crossed it by a fancy steel suspension bridge and ascended about 3000 feet to Dhankuta, the dream town of all our lives. Imagine to yourself a clean, happy, prosperous village, built with taste and style, beautifully situated on a ridge where poinsettia and bohinnia trees are in bloom. Its streets are swept twice daily, and its houses replastered twice yearly. We visited the public library, the school (where English is taught) and the parade ground where, when the garrison is not drilling, the children play soccer, volleyball and badminton—amazing sports to find in a town in faraway Nepal! None of us will forget Dhankuta and its bright cheerful people, or the words we saw written in English on one of the school buildings: "Gather courage; don't be a chicken-hearted fellow." Not a bad motto for a school, we thought—or for an expedition.

The Governor of Dhankuta was extremely kind. He arranged for coolie replacements and food for the caravan, gave us directions about the next stages of the route and supplied us with a Jemadar (lieutenant) and three soldiers for an escort. Their job was to take us to the next province and turn us over to the next governor's men; but, owing to a misunderstanding about the rendezvous, everyone missed connections. Not daring to leave us unattended, the four Dhankutans stayed with us for the whole trip.

It was a steep climb above Dhankuta to the crest of the second big ridge where, near Pairibas, we had another superb view of the mountains. No sign of Everest yet, although we wondered if the cloud streamer midway along the ridge of Chamlang might belong to it. This would have been possible, as Everest lies directly behind. Camp III was part way down the vast terraced hillside, with the Arun Valley lying just below. Next morning (November 2nd) we dropped down to the river, went on up for a bit and pitched an early camp that afternoon right beside it.

By this time we were beginning to settle down into expedition routine. After swims all around, everyone involved himself in characteristic pursuits. Bill Tilman, champion bread-maker, was mixing

dough, in up to his elbows. Charley went off with a fishing rod in search of mahseer, the fighting fish we had all heard so much about. Andy got out his instruments and calculated temperatures and the like, while Oscar smoked his pipe and studied the map that already we were beginning to find full of inaccuracies. I was busy looking over the supplies and planning supper with Gyaljen Senior, who had turned out to be a marvellous cook. The Sherpas were wonderful. Accustomed to the American do-it-all-yourself system, I never could get over the speed and skill with which they would get the tents up, blow up the mattresses, lay out sleeping bags and all the gear, bring to each Sahib a change of shoes plus hot water to wash in, and then announce tea. A soft life!

Two more days were spent working up the Arun, and on November 4th we crossed it at Kattegegat in a 20-foot dugout canoe. Three accomplished oarsmen maneuvered us neatly through the swift green current. Next came two days on the Irkua Khola, a tributary of the Arun, which we followed to Phedi. This was a small settlement at the foot of the long hill leading to the 12,000-foot Salpa Pass. Here we began to have troubles. Many of the lowland coolies were turning back now that high country was ahead; and all efforts to get replacements, as well as food for the entourage and supplementary meat and vegetables for ourselves, seemed unavailing. The next days were anxious ones. At several points a complete halt threatened. Everyone was packing a load now, even the Jemadar and his men, and the *bandobust* (Urdu for caravan) was beginning to wear a lean and hungry look. Added to these anxieties was the realization that the journey was proving considerably longer and harder than we had expected. We had just 36 days for the round trip; if we took too long either going or coming, the time left for the mountain might be too short for us to accomplish anything.

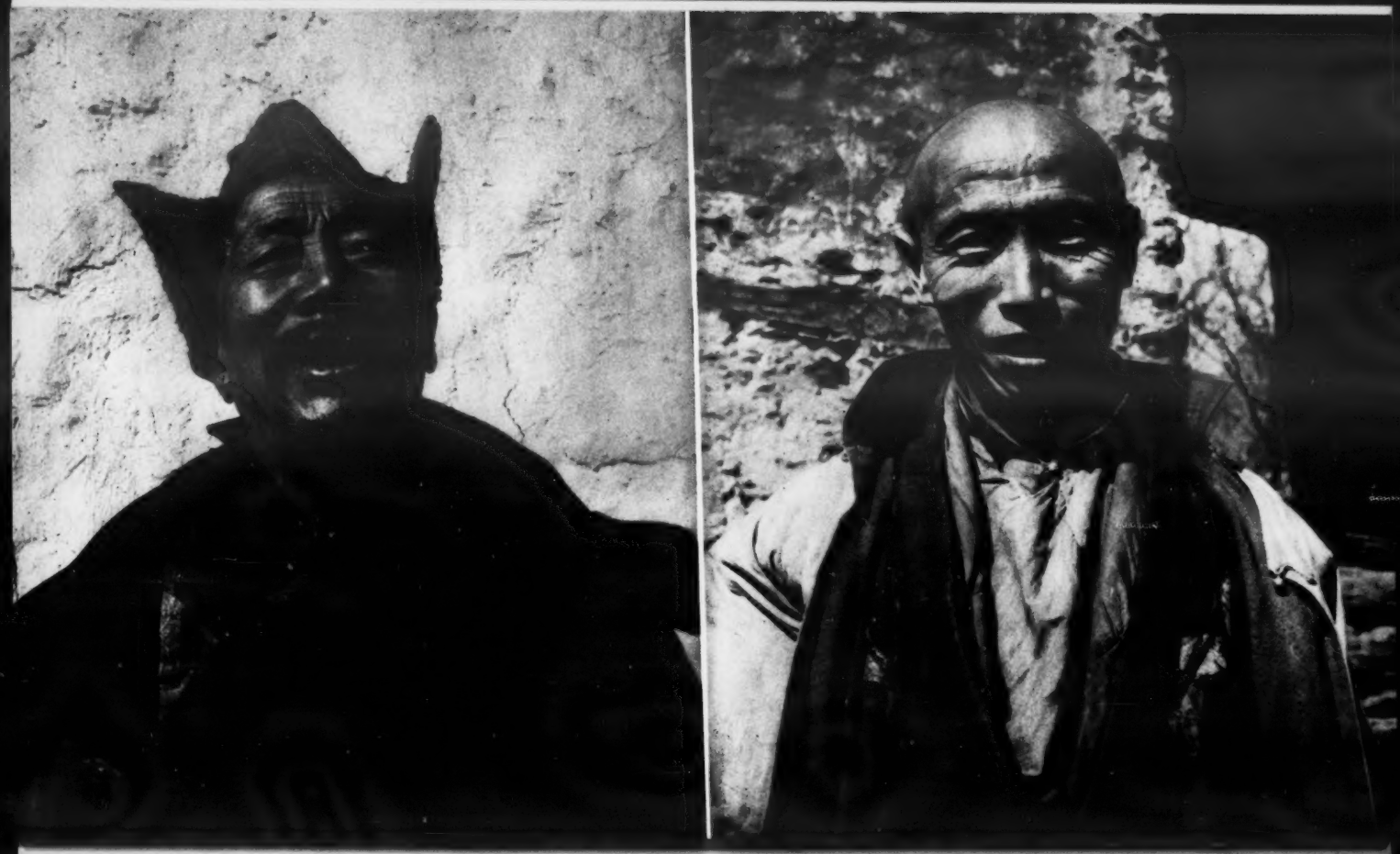
These were also our hardest marches to date. We crossed the Salpa La on November 8th and made a long descent to Gudel through great forests of holly and rhododendron. The short winter day was hampering. It was not light much before six, and dusk began to fall about 5.30. It took a good bit of doing to get in the eight to ten miles that seemed to be our daily limit and still have time in the afternoon for the relaxation that is so important for an expedition's well-being. From Gudel it was rather dispiriting to see the Hongu River apparently still miles below, and, on the other

side, the long ascent to the next pass. But what wonders just putting one foot in front of the other can accomplish! Two days later we found ourselves safely over pass two and able to face pass three (for there was another) with growing fortitude. We just plugged along. The river crossings were a thrill because of the variety of bridges, usually made of bamboo and very wobbly; and the ascents to the passes were enlivened by arguments among the experts as to altitude and distance. Nobody seemed able to decide whether it was better to expect the climb to be longer and higher than it actually was or to regard everything with undaunted optimism. (I inclined to the latter view.) On November 10th we crossed the Innukhu River and in one long Spartan day surmounted the last ridge remaining between us and the Kosi Valley.

Things were beginning to look up. Being in Sherpa country now, we could obtain food far more easily, and we had been lucky enough to find some strong hill men to help carry for us. The high mountains were very near. Up every side valley we saw new groups of magnificent snow peaks. Below us was the Dudh Kosi, the river that drains the south side of Everest; but of the monarch himself there was still no sign, although we thought and talked of little else and never came around a bend without hoping. Namche Bazar was three days' march up the valley. The Sherpas showed us where: on a high plateau at the foot of a handsome rock peak called Kumbila. We were really getting places.

On November 14th we reached Namche. The day, clear enough at the start, was rapidly darkening, and a curtain of clouds was drawn across the high country ahead. It was a wonderful solid winter town, row upon row of stone houses, with dark roofs, doors and shuttered windows. A reception committee had met us a mile or so down the trail with a flock of small, bell-hung Tibetan ponies. Everybody bowed and smiled and salaamed, and we mounted the horses and entered the town like Alexander the Great. Then followed a period of goldfish-bowl life beyond description. Our tents were pitched on a small terrace (in the Nepali sense) around which the entire population gathered. It was like finding oneself on the stage for a 24-hour show, for which every seat had been sold for weeks. Despite the charms of Namche and its people—and we did like them all—it was something of a relief to be going on up to Thangboche the next day.

THE YOUNG HEAD LAMA OF THANGBOCHE
*Photo, Elizabeth S. Cowles*



But when we woke up on the morning of the 15th, it was snowing. We were 12,000 feet up now; and, although the temperature did not go below 18°, this represented, according to Andy, a 100-degree drop since the midday sun of the Arun Valley. We walked along shivering in a winter wind; but we found it impossible to complain, warmly dressed as we were, while our coolies in their flimsy cotton garments and bare feet were trotting along faithfully in front of us. Everest lay right ahead, we knew, but all we had was a hint now and then of distant crags and slopes through the mist, and of the Dudh Kosi in its wild gorge far below. At noon we reached Thangboche. Here there was a lamasery where Oscar, Andy and I were to stay while the advance party continued on toward the mountain. It was still snowing. A lama greeted us and very kindly put a small house at our disposal for the five days of our stay. After a farewell lunch together in our new domain, Bill and Charley left, taking Sarki, Da Namgyal and two Sherpa coolies, with supplies for six days. If they were not back on the 19th, they said, we were to return to Namche, and they would catch up with us. I must confess that the stay-behinds felt rather low after they had gone. The thought of the storm worried us all. Good visibility was an absolute necessity for the reconnaissance. Could it be that our luck had changed, and that a real break in the weather was in store for us?

What a lifting of the hearts the next day! We awoke to blue sky, bright sunshine and an outlook that must surely be one of the most magnificent in the whole world. Everest was just ahead. Its vast bulk and that of Lhotse beside it filled massively the whole great V of the valley. People have said that Everest is not beautiful —and they are quite right. But there is something profoundly moving about having the biggest hill on earth right in front of you, yours to see day after day, in all the lights and in all the moods. The south wall was rugged as a fortress and amazingly free of snow. Nuptse's long dark ridge cut right across it like a rampart and then mounted steeply to join Lhotse on one side. Everest flew no cloud banner that day, but we were to see its ice plume later on and marvel at the force of those high, cold winds. Of course, the mountain does not begin to look as high as it is, but that evening the setting sun was blazing away on the huge incredible face long after the rest of the world was in darkness. That told us a lot.

"GOOD FEELING AMONG US ALL . . ."
*Photos, Elizabeth S. Cowles*

But Everest was not everything. On every hand there were peaks like nothing I had ever seen or dreamed of, and their tapered summits and fluted white faces shone in the sun against the deep blue sky of that marvellous day. Yesterday's snow lay everywhere around. A flock of yaks made dark accents against it. And the lamas made bright accents against it as, young and old, they went about their business dressed in their bulky, red homespun gowns. There were 25 lamas in all here at Thangboche, ranging in age from about eight to well over 60. This was a very cheerful, happy place. The little lamas were bright and responsive, and giggled and cut up like any other small fry. The older lamas had sweet, peaceful faces and treated the younger ones with warmth and affection. All were exceedingly kind and attentive to us and showed enormous interest in everything we did, said, ate or wore. English lessons were very popular. In no time the whole lamasery could count up to 30 and knew the words for nose, eyes, teeth, hair and the like. They went about shaking hands and saying, "Good Morning," in exact imitation of our inflection and tone of voice. In return, they taught us their names for the mountains and wrote them down for us in beautiful, careful Tibetan script. *Chomolungma* meant Everest and its satellites, Nuptse, Lhotse and the rest. *Andumlungma* was the spectacular wedge-shaped peak on the right side of the valley, with *Kantega* next to it and then my favorite, which was called *Tamusurmu*. It was like a cathedral, with a cluster of lofty spires connected by delicate, graceful and shining snow ridges. We were picture-taking like mad. Oscar and I worked around the Gompa mostly, but Andy went farther afield. He took telephotos of Everest from high up on the neighboring slopes and one day went over to Taweche with Pa Nurbu for valuable shots from the west.

From time to time we were invited to services at the lamasery. These were very interesting and impressive. The 16-year-old Head Lama, believed to be a reincarnation of his predecessor, and through him of the great Buddha, sat behind a sort of pulpit on one side of the ceremonial room. Books lined two sides of the room; the other walls were brightly painted and decorated. Sacred banners hung everywhere. In rows of squat brass bowls, candles were burning. After we were seated, the lamas marched in, each kneeling and touching his forehead to the floor before an altar in the center. Then everyone sat down, the older ones around the sides of the

room and the youngsters in two rows down the middle. Next a kind of intoning began, led by a patriarch with a deep, rich bass. At intervals everybody would pick up an instrument, and a weird, strident music would burst forth. This was rhythmic rather than melodic; it was given range and color by the contrast of tones joining in. There were two immense horns, like Alpine horns, and conch shells with a deep, throaty note. There were smaller soprano horns, and pipes, cymbals and bells. There were three vast drums. We had heard these drums often: at 4:30 every morning they announced the beginning of the lamasery day.

Sometimes Tibetan tea (very strong and buttery) was served as part of the ceremony. We were each given a cup that was filled over and over from a great silver pot that went the rounds. Or a few grains of rice would be handed around that everyone tossed into the air as prayers were chanted. We presented the Head Lama with gifts, using the white silk scarves of Tibetan tradition as channels of communication between us. He gave us presents, too—amulets to wear, a packet of little colored pellets to ward off misfortune, and more of the long white scarves. One afternoon, word was sent down for us to go up to the Gompa to watch one of their dances. This was just what we had been hoping for. The dance was held in the open center courtyard of the lamasery with the warm sun pouring in. The four performers had costumes that were all brilliant reds, blues and yellows; and they wore wonderful high, gilded headdresses. The musicians were placed in one of the open upper galleries and provided the strange strident background to the slow, graceful, stylized motions of the dancers below. Another day we asked the lamas if we might take their pictures—and how they loved it! Lots of decorating and primping and all the lamas in their best outfits, the lamasery treasures set around so they would show, and the young Head Lama very fine in a large, bright red hat.

When day succeeded day and the weather still held fine, we began to feel wonderfully hopeful and encouraged about the reconnaissance. Excitement mounted as the 19th approached. That afternoon all eyes were riveted on the path. At about three o'clock we saw them coming slowly up the trail, a very weary-looking party. Sarki, helpless with an attack of malaria, was being carried by one of the Sherpas at the rear. But despite the grim look that this gave

things, the news was splendid. Charley and Bill gave us a complete report of their successful undertaking around the tea table in our little lamasery room.* It was a happy reunion. The lamas dropped in to hear about everything, and Gyaljen served a meal worthy of the greatness of the occasion. As for Sarki, he was dosed with appropriate medicines and was his old self in a few days.

The morning of the 20th was clear and fine as we wound up our Thangboche affairs. Everyone gave everyone else presents, and we all waved and smiled and said goodbye as the caravan started down the steep trail on the return journey to Namche. The low-country coolies, who had been vacationing below, presented a transformed appearance, with warm blankets around them, knitted caps on their heads and an air of having been completely Sherpa-fied. The bandobust was a real unit now. There was loyalty and good feeling among us all. You never passed anyone on the trail without getting a quick, friendly smile; and cheerful sounds of laughter and conversation abounded. Back at Namche, we enjoyed about the same measure of privacy as before; but the warmth of our welcome pleased us all, and the goodbyes next morning were touching. Charley gave the head man (with the wonderful name of Nga Wong Tchetem) his American hat as a parting present. The effect on that gentleman of switching from a Tibetan bonnet of fur and brocade to the Knox number was *something!* Then we started down the descending path with last looks back at the sturdy little town and at Everest, still grandly in view up the valley.

The trip out went very fast. We were in the best trim of our lives and could walk tirelessly for hours. Seeing everything in reverse was wonderful, fixing the lay of that marvellous land firmly in our minds. First, goodbye to the Kosi Valley and back over the passes—then goodbye to Sherpaland, to mani walls and chortens, and the little Buddhist prayer flags fluttering in the wind. To Phedi again, and down the Irkua Khola, and then the Arun once more, on November 29th, just a week away from Namche. Down here it seemed very warm, relaxing and civilized. People along the path brought us oranges, bananas, honey, flowers. What a delightful land! We thought and talked a lot about its endearing qualities as we passed for the last time the familiar terraced hills, the trim

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*See C. S. Houston, "South Face of Mount Everest," pp. 12-21 below.—*Ed.*

little thatched houses and the many shady resting places on the trail, well-remembered from the journey in.

We left our old route near Pairibas to go out via Chatra and the site of the proposed Kosi dam. On December 2nd we reached a point near the confluence of the three great rivers, the Arun, Tamur and Sun Kosi. It was just above here that we heard for the first time of the revolution in Nepal. We had been met by two men in uniform sent very kindly by our friend the Governor of Dhankuta to see that we got across the ferries and down the roads closed to travel by the emergency. But all went quite peacefully for us. We crossed the river by a little open car on an overhead cable (very sensational!) and swung down the broad smooth track toward Chatra, passing the Kosi dam site on the way. This was very interesting. If it is built, it will be the highest dam in the world and will back up the rivers as far as 80 miles, radically changing the character of much of the country we had just gone through. At Barakshetra, where the headquarters of this project of the Indian government are, we were pleasantly entertained by the members of the staff. From them we heard of the abysmal turn that world events had taken. It sobered us considerably. The contrast between outside reality and the free, simple, vigorous life we had been leading struck us all with great force, as it must all those who return from the wilds.

Endings are always sad. December 5th brought the wind-up of the expedition at Chatra, and the members began the long process of getting themselves back to where they came from: to Dharan, Dhankuta, Namche Bazar and Darjeeling, back to England and to the United States. Coolies, soldiers, Sherpas, Sahibs—what a variety of people to have shared for a time the responsibilities of a common enterprise! I should like to think—and do—that, as it was possible for this oddly assorted group to live and work happily together, on a tiny scale, one can reasonably hope for our world that big groups, varied though they may be, will one day be able to work peacefully together on a big scale.

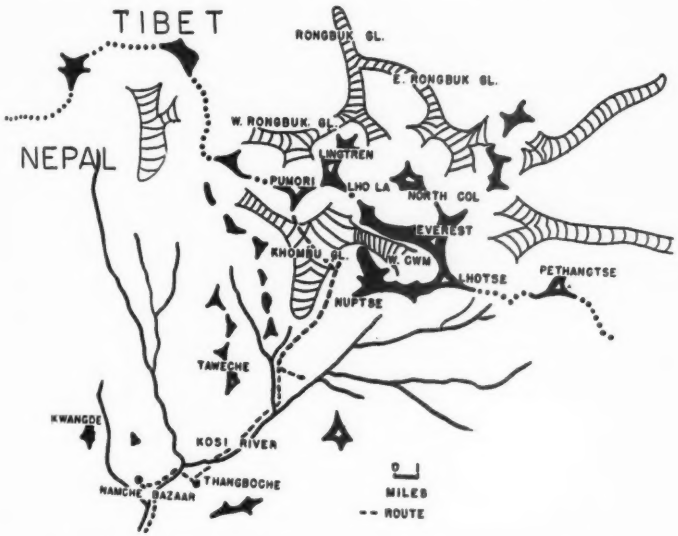
## II. SOUTH FACE OF MOUNT EVEREST

CHARLES S. HOUSTON

When Tilman and I set out from the lamasery of Thangboche on the afternoon of 16 November 1950, we had six days in hand—six days in which to examine the unexplored south side of Everest. Obviously in this brief time we could do little more than form an over-all impression of the climbing possibilities and bring back all the photographs we could take. It was disappointing to have reached this heretofore unexplored area without time for a proper reconnaissance, but we had known from the start that we should be unable to do anything like the splendid job which the first party to the northern side of Everest accomplished in 1921. Our party had been perforce hastily assembled; it was small, lacking in personnel and equipment; and we were squeezed by the lack of time, for all of us had unbreakable commitments early in December. It was up to us to make the best use of what little time we had.

The great rock wall which is known as the Nuptse-Lhotse Ridge fills the upper end of the Kosi Valley and dominates the view from the lamasery of Thangboche. As may be seen from the photograph and rough map, the actual summit of Everest lies to the north, well behind this formidable rampart from which it is separated by a confused maze of ridges and icefalls. Our first thought—that Everest might be reached by climbing the southern face of Nuptse—was obviously ridiculous: the climb would be extremely difficult and would only land one on a high ridge (26-27,000 ft.) some two miles from the summit cone of Everest. Nor would the ascent of the southeast ridge of Lhotse, a more attractive climbing route, be much more helpful. The 1921 and 1922 parties had looked at the Lhotse-Everest saddle (the so-called South Col, 25,850 ft.) from the Kama Valley below Pethangtse (see photograph). Although the route from there to the summit seemed climbable, they saw no way to reach the South Col short of climbing over the top of Lhotse (27,890 ft.), and then descending 2000 feet before attacking Everest itself. These considerations, together with inspection of the massif from Thangboche, persuaded us to devote our attention to the western side. We hoped to pass around and behind the western end of Nuptse, enter the West Cwm (part of which had been seen from the north) and examine the true south face of Everest.

The magnitude of this task was much in our minds as we trudged up the valley that afternoon, through lightly falling snow and in fog. It was discouraging to have our first bad weather on the first really important day, and our camp that evening in a shepherd's hut was rather cheerless. The wind rose during the night, however, and we woke to a crystalline morning, bitterly cold but cloudless. As we walked up the cattle trail, the Nuptse-Lhotse ridge towered above us. It was obvious how easily the natives could




SKETCH MAP OF EVEREST AND ENVIRONS SHOWING ROUTE OF APPROACH

mistake this subsidiary ridge for the complete mountain, calling the massif by the name "Chomolungma" (Goddess Mother of the Snows).

Beneath the foothills leading to this ridge, the Kosi River divides, part coming down from the glaciers below Pethangtse and Lhotse, while the large part drains the western valleys. We turned up the western branch and soon came out on a large flat plain, perhaps one mile by two, obviously the dry bed of a now defunct lake. On each side rose moraines, three levels in all, the uppermost 500 feet above

the valley floor. We camped about noon in a summer grazing alp called Phalong, and after lunch Tilman and I left our three porters and climbed up the grass slopes to the north of the valley, hoping to reach a rock ridge from which we could see the south face of Lhotse in profile.

The afternoon was perfectly beautiful—cool and clear and cloudless. About us were magnificent peaks, unnamed and unclimbed. To the east the immediate spectacle was a 22,000-foot peak of exceptional steepness which we called the Matterhorn Peak because of its close resemblance from several angles to the peak above Zermatt. We could see no feasible route up this mountain. At its foot lay a glacier (receding rapidly, as we judged by its moraines), near which was a summer village named Dingboche, where there was a small monastery. To the left of the Matterhorn Peak and some 20 miles to the east rose the reddish-brown bulk of Makalu, speckled with snow and very impressive because it rises almost alone and is not belittled by surrounding satellites. We could not positively identify the north side of Chamlang, the great snow ridge which hides Everest from view during the entire approach from the south. Farther to the left (north) were smaller snow peaks which mark the Tibetan border and which have been examined from the north by several British expeditions.

Looking due south down the Kosi Valley, we could clearly see the ridge of Thangboche with the triangular ice spire of Kantega rising above it and Tamusurmu farther east. We could even see Kwangde, the rounded rock mass coated with ice, which rises across the Kosi below Namche Bazar. Directly across the valley from us, and only a few miles away, was a most inspiring peak—Taweche (21,390 ft.), which seemed almost as unclimbable from this side as it had from the south. Continuing to the west in a series of giant steps were several smaller but no less precipitous peaks, until one's eyes fell to the Solah Glacier, which comes in from the west.

Despite the magnificent scenery and weather, we made slow going of our climb. For nearly three hours we plodded up grass slopes too steep for easy climbing but steep enough to be very wearying. Always the next "ridge" seemed to promise our view; inevitably there was another dip and a farther ridge beyond. Toward the end of the afternoon we dragged ourselves up a sharp rocky

*Photo, C. S. Houston*

"MATTERHORN PEAK"

ridge of granite slabs only to find a deep "gunsight" notch separating us from the main ridge, which was still several hours distant. This finished us: there was nothing to be seen of our objective from the point we had reached, and no chance of going farther that day. We wearily returned to camp, though not before the indefatigable Tilman had shamed me on the way down by climbing an extra thousand feet to a small saddle—the view from which was again frustrating.

Our porters greeted us with steaming mugs of tea as we staggered into camp at dusk. We were both very tired, and I for one had a splitting headache, though our camp was at only about 14,000 feet and we had certainly climbed no higher than 17,000 feet. That night, around a roaring fire (of wood brought up by the porters, for only scraggly gorse and juniper grew here), we reminisced about Nanda Devi and the Karakorum; and Tilman brought out odd tales of Sinkiang, Hunza, Sikkim and other exciting areas where he had climbed. By bedtime our talk had made us considerably stronger.

In the morning we started early, planning to establish camp four miles or so up the Khombu Valley. For a mile we followed the northern side of the valley, then turned north, climbing steadily over old moraine to reach the lower end of the Khombu Glacier. This, like all the others we saw, seems to be dying rapidly. Very little ice is visible beneath the rubble that covers it. Consequently, the lateral moraines are unpleasant to march over, and we were glad to camp on a sand bank near a frozen lake about four miles above Phalong. The temperature, even in the warm sun, was below freezing; and, since there was a light but chilling breeze, we did not linger over our luncheon but set off early to continue up the valley.

We hoped to reach and look around the "corner" of a great rock rib which seemed to separate us from the West Cwm, and which we estimated was three miles from camp. If we could see into the West Cwm, from the Khombu Glacier, we could form some idea of the character of its headwall and get a profile view of the south face of Everest itself.

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MASSIF OF CHOMOLUNGMA FROM LAMASERY OF THANGBOCHE
Nuptse is on the left, and Lhotse on the right, with the summit of Everest showing over the middle of the Nuptse-Lhotse ridge *Photo, Elizabeth S. Cowles*

SOUTH COL FROM SLOPES OF PETHANGTSE
Lhotse is the highest summit in the center. To the right are the South Col and the summit of Everest. The photograph was taken looking almost due west
*Photo, 1921 Everest Reconnaissance, by permission of the Himalayan Committee*

Members of the 1921 expedition to the northern side had looked from the col below Pumori directly across the upper Khombu Glacier into the West Cwm. Mallory (1921) described the glacier as being "terribly steep and broken," and he did not think it possible to reach the South Col from the floor of the West Cwm.[1] They did not have an unobstructed view of the south face of Everest; nor could they see the southern face of the Lho La, the 20,000-foot saddle below the western buttress. The reconnaissance of 1921 reached the Lho La from the upper West Rongbuk Glacier and considered the southern side of this 19,000-foot pass very difficult, though they did not try it. Both the 1922 and 1938 parties had reached the North Col by climbing up the western slope from the West Rongbuk Glacier, a route less dangerous from avalanches but more laborious than the eastern slope.

Three questions were before us: (1) Was there a new direct route to the summit of Everest from the floor of the West Cwm? (2) Could we see a feasible route over the Lho La, from which we knew a route was possible to the North Col and thence onto the usual climbing route? (3) Was there a possible route up the western shoulder of Everest, originating near the mouth of the West Cwm, and eliminating the need of crossing the Lho La? We hoped to answer these questions in the two days that remained to us.

Again we were travelling slowly. The footing was poor, and there was much up and down over the nasty sliding gravel and boulders that make up moraines the world over. It was clear by three o'clock that we could not hope to round the corner that day. Tilman, who was well ahead of me, turned west to cross the Khombu Glacier; and I did so at a lower level.

Here, some three miles above camp and five miles below the Lho La, the glacier shows more ice; and hundreds of pure white pinnacles, many over 200 feet high, rise from the flat moraine-covered glacier like the "ice ships" of the Baltoro and Rongbuk Glaciers. We stopped on separate ridges about half a mile out on the glacier and realized for the first time that our "corner" was in reality a broad rounded face which gave into the West Cwm only gradually and which we could therefore not look around without a great deal more travel than we had reckoned. Sadly we turned

[1] *Mount Everest: The Reconnaissance, 1921*, p. 214.

back to camp, frustrated in our effort to get a decisive view. Again we were both worn out when we reached camp after dark and huddled around a pathetic fire of gorse which the porters had spent the afternoon gathering. As usual, a cold evening wind blew briskly up the valley. We retired to our sleeping bags about seven, and spent a cold and restless night.

Our final day, November 19th, was cloudy—a disappointment, for we had hoped for blue sky behind our peaks. After directing the Sherpas to break camp and return to Phalong, Tilman and I started up the route of the previous day, again finding the moraine unpleasant going, and crossed the Khombu Glacier about two miles above camp. This took some time: there was still a dusting of powder snow over the ice, and our rubber-cleated boots were dreadfully slippery. Both of us were tired and slow, and it was not until nine that we reached the western side of the valley and started up the lower slopes of Pumori ("Daughter Peak," named by Mallory in 1921). Fortunately, the weather was clearing somewhat. We knew we would have our views, though without the blue-black sky which makes color photographs of high mountains so spectacular.

Again we trudged painfully up the steep grass and rock slopes for several hours and finally, about noon, came out on a rocky ridge just below the snow line, at an altitude above 19,000 feet. Here we stopped for lunch. We could now look northeast to the Lho La (20,000 ft.), about two miles away (see photograph). Directly above and behind it was Changtse (North Peak, 24,730 ft.). The North Col was out of sight behind the western buttress of Everest, which rose steeply and bluntly to the West Peak, much foreshortened in our photographs. Behind the West Peak, we knew, lay a long ridge leading gradually to the final pyramid. The southern side of the Lho La, as can be seen in the photograph, is a steep and broken rock face, swept by icefalls from above; and up it we could see no route which would not be dangerously exposed to falls from above. Once on the Lho La, should it prove climbable (a dubious possibility), a party might conceivably work out a route up the western buttress, or it could cross the West Rongbuk Glacier and climb to the North Col, as mentioned earlier. To us, seated on the ridge of Pumori, neither of these routes seemed feasible.

We could see across the north face of the final pyramid to the First and Second Steps, which were conspicuous on the skyline; and we could easily identify the great snow couloir above the yellow band, which marks the high point reached on the northeast ridge. To our great surprise, there was very little snow on the north face, though the monsoon had probably ended only six weeks previously. This observation gives some support to those advocates of post-monsoon attempts on the mountain. We had, however, noticed high winds blowing across the mountain, usually from due west, during most of our approach. These steady blasts had probably swept the rocks as clear as they ever are. The south face of the summit pyramid was also surprisingly free of snow, but it seemed to us considerably steeper than the north. There we could again see the yellow band continued through the mountain, but higher on the southern face, where the strata slope inward instead of shingle-wise as on the north.

Unfortunately, we could not see far into the West Cwm. Only the lower quarter was visible from where we sat. What we could see confirmed the estimate made by Mallory in 1921: passage up the West Cwm would be very difficult or impossible. Though neither he nor we could see the headwall which leads to the Lhotse-Everest saddle (South Col), this does not seem a reasonable route by which to climb Everest.

The south face of Everest and its western shoulder shown in the photograph do not seem much more promising. Though a route might be found for seasoned climbers, we could see nothing which seemed practicable for the establishment of a chain of camps. In estimating the climbing possibilities of any mountain over 25,000 feet high, one must always remember not only that a climber can perform less well, but also that a porter train is forced upon him, and that campsites as safe as possible in fair weather and foul must be found. No route which satisfied these requirements was visible to us on the southern wall of Everest.

In studying these possible routes, I was continually brought up

FROM 19,000 FEET ON THE SOUTHEAST SLOPES OF PUMORI

Top: Khombu Glacier (foreground) leads up to the low saddle of the Lho La with Changtse (North Peak) directly behind it. The mouth of the West Cwm is seen below and to the right of the Lho La. On the right is the western buttress leading up to the summit cone of Everest

Bottom: This is continuous with the plate above. The western buttress leads to the black summit pyramid of Everest on the left of center, with one of the spires of the Nuptse ridge on the right. The West Cwm is directly below the summit pyramid of Everest

*Photos, H. W. Tilman*

short by Tilman's reminder that a satisfactory route has been worked out on the northeast ridge, and that any route chosen elsewhere should promise to be at least as feasible. If some of the world's finest climbers have failed on a route which is not exceptionally difficult, who is likely to succeed on one which is more difficult and uncertain?

Early that afternoon we started down for our camp at Phalong, following the western side of the Khombu Glacier, which proved to be considerably easier though slightly longer than our ascent on the eastern moraines. On the following day we returned in one march to Thangboche, carrying one of our Sherpas, who had developed a recurrence of old malaria. There we were warmly greeted by our comrades, who had had an exciting and heart-warming stay with the lamas. Bakewell had made two fine expeditions, one up the eastern and one up the western wall of the Kosi Valley, climbing to about 17,000 feet and taking a number of exceptional photographs.

After a tour of the lamasery and an audience with the head lama, we all returned to Namche Bazar, gathered up our coolie train and marched back to India. The return trip, a happy picnic, took 14 days. We arrived in Biratnagar, the frontier of Nepal, on December 4th, just 36 days after the start of our trip.

Norman Collie has expressed very well the emotions which are stirred by such a trip as ours: "The chance of wandering into the wild places of the earth is given to few. But those who have once visited the Himalaya will never forget either the magnificence or the beauty of that immense mountain land, whether it be the valley country that lies between the great snow-covered ranges and the plains, where wonderful forests, flowers, clear streams and lesser peaks form a fitting guard to the mighty snow-peaks that lie beyond, or the great peaks themselves, that can be seen far away to the North, as one approaches through the foot-hills that lead up to them. . . . One may be contented and busy with the multitudinous little events of ordinary civilised life, but a chance phrase or some allusion wakes the memory of the wild mountain lands, and one feels sick with desire for the open spaces and the old trails."[2]

So far as the ascent of Everest is concerned, we have little

[2] *Mount Everest: The Reconnaissance, 1921*, pp. 304-5.

MOUNTAINS BEHIND NAMCHE BAZAR
*Photo, Elizabeth S. Cowles*

encouragement for climbers. The northern approach through Communist-dominated Tibet appears to be closed to us indefinitely, and only the southern route through Nepal offers even a remote promise of being opened. This approach would have several advantages over the northern route: it is short (two weeks); it lies through fertile, populated country; and it entails no prolonged exposure to the wind and dust of the Tibetan plateau, with attendant respiratory ailments. But the southern route is passable only before or shortly after the monsoon because of the flooded rivers during the rainy season. A comfortable base camp could be established at Phalong, supported with ease from Namche Bazar or by an air drop on the old lake bed. The advanced base could be placed on the western bank of the Khombu Glacier, which has pleasanter surroundings than the eastern bank. All these plans depend, of course, upon the discovery of a practicable climbing route on the south side of Everest, a discovery which we have certainly *not* made.

Our entire trip was made after the monsoon was well over, and we saw the north and the south sides of Everest in late November. During the entire five weeks of our trip we had two bad days, and on only one of the days when we could see the high mountains were they clouded. As we were leaving Nepal, the mountain weather appeared to be deteriorating; perhaps the "Christmas snows" were beginning. There was very little snow on Everest in late November, but we saw winds of very high velocity sweeping across the mountain, and even at 17,000 feet the temperature was well below freezing. It is possible that the high mountain temperature is not much lower than that in the valleys; this was our experience on K2 in 1938. But wind is a terrible enemy, and the Everest climber must be prepared to face killing winds and blown snow and intense cold, regardless of route or season. From our experience I believe the post-monsoon season would be no worse, and might be much better, than the uncertain period between winter and the beginning of the monsoon.

We had been for five weeks in an area never previously visited by Europeans or Americans. We had marched some 175 miles along rough valley trails, over three 10,000-foot passes, across rude bridges to reach the foot of the highest mountain on earth. There we had found a small community, centered in religion, self-sufficient, self-respecting, happy and healthy. Surrounded by scenery

beyond description, this small lamasery and attendant village seemed to us a beautiful oasis in a troubled world. In all our travels we met nothing but friendliness and courtesy, and some of the people we met were extraordinarily kind to us. Our eyes were opened to a different way of life, a different religion. It was hard to return from this happy primitive land to a world in which our first news was of the U.N. reverses in Korea and of political unrest along many borders. It seemed at least debatable that we were returning to civilization. As we came back to the worries, the pleasures and the responsibilities placed upon us by our own way of life, we could not forget the motto over the public school in our favorite town of Dhankuta: "Gather courage; don't be a chicken-hearted fellow."

# Up Yerupajá

W. V. Graham Matthews and David Harrah

## I

THE Cordillera de Huayhuash, less than 20 miles long, contains some of the most spectacularly difficult peaks in Peru—a country where such peaks are the rule rather than the exception. Less than three decades ago, the mountaineering challenges of the range were completely unheralded; and even today mention of the Huayhuash to a Peruvian is apt to bring only the response that one is doubtless mispronouncing the name of some other range. But recently climbers have come to know about the Huayhuash through the work of O. M. Miller,[1] William Jenks,[2] and especially Dr. Hans Kinzl and Erwin Schneider, who contributed much knowledge of the country[3] and a fine map published by the D.A.V. in 1939. The dominating summit of the range is Yerupajá (21,769 ft.).

Although American climbers had been discussing the possibilities of an expedition to Yerupajá for several years, and the Harvard Mountaineering Club had organized an expedition for 1948, it was not until June 1950 that the Harvard Andean Expedition arrived in Lima. Denied the blessing of any mountaineering club, the expedition nevertheless had managed to complete successfully the work of organization and preparation, thanks largely to the perseverance of George I. Bell and Austen F. Riggs. By the middle of May, nearly a ton of equipment was on its way to Callao. Less than a month later, the advance guard, Bell and Riggs, were in Lima, charged with the task of guiding the expedition's supplies through the labyrinthine red tape of the Peruvian Customs.

By June 26th all was in readiness. The remaining climbers, Charles C. Crush, David Harrah, W. V. Graham Matthews and James C. Maxwell, had deplaned in Lima. In addition, Sr. Juan Ormea and his son Tomás were ready to handle the expedition's ornithological work; and Jack Sack, who served as United Press correspond-

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[1] "The 1927-1928 Peruvian Expedition of the American Geographical Society," *Geographical Review*, XIX (1929), 1-37.

[2] "Climbs in the High Andes of Peru," *A.A.J.*, IV (1941), 157-76.

[3] Kinzl, "Die Kordillere von Huayhuash (Peru)," *Zeitschrift des D.Ö.A.V.*, LXVIII (1937), 1-20.

ent for the expedition, was already filling the local press with fables of our activities and ambitions. It should perhaps be stated that the expedition indulged in this romance with the U.P. not out of any wanton desire for publicity, but in the hope that thereby some of the expenses might be defrayed—a hope which was never fulfilled. In the early evening of June 26th, the expedition lumbered out of Lima in a heavily-laden truck very kindly lent by the Inter-American Geodetic Survey.

After camping by the roadside, we awoke in glorious sunshine—the first we had seen since arriving in Peru. A brief visit to Paramonga secured breakfast and gas; and, thus fortified, we began climbing slowly through the arid valleys into the Cordillera Negra. The highway, a rather good dirt and gravel road, soon became spectacular; but a broken fan belt and a hot motor forced us to camp once again by the roadside, heartbreakingly close to the pass above Conococha, a lovely trout-filled lake which lies at an altitude of 4020 meters.

During the course of the next day, with the assistance of passing truckers, we got rolling again, dropped down past Conococha, crossed the Pampa de Lampas, and began the terrifying descent down the new highway to Chiquian. To the southeast the whole Cordillera de Huayhuash jutted abruptly heavenwards, while farther to the north loomed the peaks of the Cordillera Blanca. Just before dusk we eased our truck through the narrow cobbled streets of Chiquian, whose inhabitants, clad in ponchos of somber hue, evoked thoughts of Shangri-La. We were soon ensconced in the Hotel Bayer and immediately began making arrangements for *bestias*—pack and riding animals—a process which was to take five days, primarily because of a national election in which it was compulsory to vote. No one was willing to leave Chiquian until after July 2nd. Although we fretted at the delay, it probably helped us to acclimatize. On the other hand, indiscretions in eating the local food may well have been the source of the intestinal troubles which plagued the expedition at various times and in baffling ways for the remainder of the trip. How many of our ailments were due merely to *soroche* or mountain sickness, and how many to other causes, such as contaminated food, remains a puzzle.

From Chiquian one could obtain a fine view of the west face of Yerupajá. Through field glasses the upper portion looked terrifying

indeed, and even from this distance the rifts in the cornices, which were later to prove the key to the climb, were plainly discernible. In a moment of inspired irony Harrah dubbed the mountain "Old Round-Top," an appellation which long continued to be popular. Time passed pleasantly enough at Chiquian, with acclimatizing hikes, repacking of supplies for the mules, and innumerable games of *sapo*. The weather was fine, though chilly whenever the brilliant sunshine was absent. Yerupajá itself, however, was often hidden in clouds.

Finally, on July 3rd, with 17 heavily-laden donkeys and various mules and horses for riding, the expedition left Chiquian amid the curses of the muleteers and the good wishes of the populace. The trail wound steeply down to the Rio Chiquian, continued downstream through the tortuous gorge, crossed by a rude bridge, and then alternately climbed and descended beside the Rio Llamac, a tributary of the Chiquian. At the small town of Llamac, where we stopped for the night, the *gobernador,* apparently one of the few sober denizens, kindly allowed us to sleep in the town hall. After a fitful night enlivened by the eerie music of the drunken Indians, we set off for Jahuakocha with the assurances that it was only a four-hour trip. The trail zigzagged steeply up the ridge behind Llamac, crossed a small plateau and eventually gained the pass, then contoured more gently down to the valley floor below Jahuakocha. Eight weary hours after leaving Llamac we arrived at Base Camp, too tired to celebrate the Fourth of July.

Base Camp was pleasantly situated at the eastern end of the lake at an altitude of 4066 meters, or somewhat over 13,300 feet. Behind camp lay Solterahanca, a glacial lake impounded by moraines; and above it rose the steeps of Rondoy, from whose fluted ice-cliffs avalanches frequently thundered. Adjacent to Rondoy on the south stood the impossible Jirishanca, followed by Yerupajá Chico, and then, towering above all, the shimmering summit and west face of Yerupajá.

While the route upwards from the Yerupajá-Rassac col was depressingly clear, there were several possibilities as to the best way of getting onto the glacier and thence gaining the col. Accordingly, we divided into small reconnaissance parties to determine the most feasible route. It was eventually decided that mules could get the loads the highest by going up the Rassac valley, parallel to the Yerupajá Glacier, and then dumping the loads as high as possible on the steep

YERUPAJÁ: WEST FACE
Much of the route is shown

*Photo, A. F. Riggs*

grass slopes just north of Rassackocha. Cantankerous mules and negotiations with their owners delayed matters somewhat; but by the afternoon of July 9th most of the loads had been dumped, and that evening Bell, Harrah and Matthews, carrying sizable packs from the dump, established Boulder Pocket Camp at about 15,200 feet.

W.V.G.M.

## II

In general, the 1950 season in the Huayhuash must have been the finest in years. It certainly gave us weather ideal by any standard. Our first night at the boulder pocket, however, was exceptional, with an inch of snowfall. Matthews, sleeping out, caught some sort of chill and was hamstrung by sickness from then until the last days. Harrah and Bell set out to establish the next camp, along the route pioneered by Kinzl and Schneider—crossing the deeply-clefted northern shoulder of Rassac Ridge and then following its eastern ledge-system south to the edge of the Yerupajá Glacier. Our Glacier Meadow Camp, one easy load-carrying day from the boulder pocket, was pitched on the moraine at 16,000 feet. This camp was plagued by dirt, and it was distant from a water supply, but it had a grandstand view of the ice flutings and avalanches on Rondoy, and of the sun rising out of the summit cauldron of Jirishanca.

Bell and Harrah returned to the dump for another load, reoccupied the glacier camp, then pushed on for the col between Yerupajá and Rassac. The route followed the moraine for a mile, took to the glacier above its highest icefall, then ascended its gentle upper portion a mile and a half. The glacier was in excellent condition, hard, not requiring crampons, and permitting almost a straight-line route. Occasional avalanche danger could be minimized by a speedier pace. The safest campsite was a small platform, actually a schrund-bridge, 20 feet below the sharp crest of the col at 18,800 feet. Next morning the glacier camp resembled a movie set, with everyone converging at once: Bell and Harrah returning from the col, Crush and Riggs bringing loads from the boulder pocket, Maxwell emerging from a tent, and our Indian porters appearing first as silhouettes on the ridge and then as sweaty demanders of payment at the growing supply pile. We regretted that we had no scales, that we had not fixed prices in advance, and that we had not brought boots or bags so that the Indians could carry for us on the ice.

EAST FACE OF YERUPAJÁ FROM SOUTH

*Photo, A. F. Riggs*

Schneider, who had tried for the summit from the col, later recommended placing a higher camp near the south peak. Our Swiss friends in Lima suggested that the high camp consist merely of an ice cave, sleeping sacks and food for a one-night stand. Our plan, intended to secure the maximum safety and opportunity for acclimatization, was to stock and tent the col for six men for two weeks, and stock and tent a high camp for four men for one week. This plan had to be compromised out of all recognition: because of sickness, no more than three men were ever at the col at one time. The safety factor was maintained, however, in terms of the stocks established at these camps and our refusal to depend on any but the most favorable weather.

The next day Bell felt ill; but the four healthy members carried loads to the col, and Riggs and Harrah stayed there to make the next advance. Just over the crest the col dropped abruptly to the Yerupajá-Siulá basin. On the tent side the col dropped gently to the glacier, led the eye along the glacier between the enormous glaring flanks of Yerupajá and the stone-swept ruins of Rassac, past Rondoy and far northward to the magnificent tower of Huascarán. During the daily seven hours of sunlight at the col, our light meters registered "four times the glare of a bright day at the beach." At night there were frequent gusts of wind: we heard them swoosh like artillery shells as they came through a near-by pass, then—after a silence—explode violently on the two tents. Several members found that seconal pills made little difference to their sleep. At this altitude our appetites only gradually shifted gears from the carbohydrates-and-milk to the liver-potatoes-and-cheese speed. Altogether gone was even the thought of regaining the butter-sardines-mincemeat level. The Coleman stoves worked well; the nylon air mattresses sweated too much. Of the three tents used on the ice—an army mountain, a co-op poplin, and Gerry Cunningham's nylon mountain tent—the "Gerry tent" proved far the best in every way.

Riggs and Harrah acclimatized for two days, studying weather and routes. The crest of the southwest ridge, though safe from avalanches, was too sharp and corniced to be climbed with a pack. The only alternative route lay on the face, parallel to the ridge, tortuous and exposed, but fairly easy on hard snow. No avalanches or recent avalanche tracks had been seen anywhere on the west face of Yerupajá for three weeks; and our binoculars revealed a campsite, appar-

ently protected from avalanches, on the face near the south peak. The route up the broken ice face was so complicated that, using a sketch made from below and following the many landmarks, we could not have got lost.

At 3.30 one windy morning, after a sleepless night, Riggs and Harrah started up the face. Almost immediately Riggs succumbed to the altitude: he was cold and nauseated, and had little muscular coordination. The next morning they tried again, starting at 7.30, but with exactly the same result. Riggs, till then apparently the strongest in the party, proved how difficult it is to predict how an individual will adjust to altitude. Harrah carried the packs up several hundred feet, and welcomed Crush to the col as Riggs' replacement. Crush was still sick from Chiquian (intestinal) and Base Camp (bronchial), and after one miserable night had to return below—a fine mountaineer who never had the chance he deserved at Yerupajá.

Bell, still slightly sick himself, now came up. Next morning he and Harrah followed the route-sketch up through the ice cliffs, schrunds, traverses, corners and terraces of the face. After six easy hours they reached the high campsite, undoubtedly the only really safe campsite high on the mountain. Any camp on the ridge crest would have been exposed to the weather and difficult to retreat from in a storm. The site chosen was protected from the wind and avalanche danger by an ice overhang. To facilitate ascent of the difficult slope immediately above the camp, they planted an ice piton and fixed rope. The view from the tent extended from the Pacific past the Cordillera Blanca to the beginnings of the Amazon jungles. At evening the sun did not just set; it swooned. They made the mistake of trying for the summit the next morning, and Bell could go only 200 feet. If anyone deserved the summit it was Bell, who had organized the expedition and established all the camps on the mountain. It was the load Bell carried to the high camp that enabled Maxwell to have his chance. Bell went down while Harrah and Maxwell waited at the col to make their bid.

Fortunately, four days of light clouds enabled Maxwell to acclimatize. Then the pair reoccupied the high camp with food for six days. They waited one day, then started for the top—and turned back. Maxwell was not yet acclimatized. Because three days' food supply had to be saved for a storm, the following day was the last

possible day for a summit try. Early intimations of frostbite caused some anxiety: Maxwell had not fitted his crampons to his boots before the trip, and cold feet had forced him to change boots on the way to the high camp. Harrah's feet were feeling colder every day, undoubtedly an effect of "deterioration" (14 consecutive days above 18,000 feet). To minimize the immediate danger of frostbite, they decided to wait till 10.30 for the the morning sun,[4] trusting that the full moon would make up later for the loss of light at the start. The temperatures were warm, never below zero by the minimum thermometer at high camp. They expected to climb in Yerupajá's common light cloud plume. There was only one possible route: to gain the summit ridge just north of the south peak and follow the narrow ridge to the main summit. Knowing it was a gamble, they yielded to the temptation to travel light—a mistake, as it turned out. Actually, their biggest concern was cornice accidents, for the party had talked with Sigrist in Lima about the cornice accident on Alpamayo (Cordillera Blanca) in 1948, and the summit ridge of Yerupajá is corniced the whole of its length. They would use 150 feet of ⅜-inch nylon and carry three ice pitons.

Next morning, July 31st, they started up once again. At first the going was very slow, Harrah using his ice-hatchet and ice-hammer as claws on the steep slopes. The only break in the cornices was provided by a crevasse running almost parallel with the ridge line. They stemmed 50 feet down into the crevasse, walked 300 feet along what proved frequently to be only a false bottom, then reascended the crevasse wall to find themselves on the ridge crest. They decided that in case of trouble this crevasse would be the place to bivouac. The ridge varied between 20 and 30 feet in width, corniced on the left and dropping steeply on the right. Even in the fog there was no route-finding problem—just slogging upward in mushy snow along what seemed the safest line.

At 3.15 they were at the great final pyramid. Harrah's doubts about the danger of the place were overcome by Maxwell's cheery assurances. With extreme care they ascended the 300-foot corner, using both double-axe technique and occasional rocks for holds. From the top of the rocky face, the final summit ridge led gently upward another 100 vertical and 300 horizontal feet. It was very

[4] Apparently a common tactic on the western slope of the Andes. One party on Huascarán started for the top at 11.00.

narrow and everywhere corniced. Since they were so near the top and in so dangerous a place, they should have called this point the summit. They decided, mistakenly, that careful belaying would justify a traverse to the highest point. Actually, in places like this, the belayer is as likely to fall as the climber (*e.g.,* the Alpamayo accident). At 5.30 they stood one at a time on the top, a flat cornice. The clouds broke, revealing a view more of heaven than of earth.

After taking a few photographs, they began the descent, with two hours of sunshine left and the high camp three hours away. Harrah joined Maxwell at one belay platform, and Maxwell said he was going to take a picture. The platform, about seven feet wide, appeared to be solid, but seemed as subject to avalanching on the east as to cornice-fracturing on the west.

Almost immediately, a small section broke away beneath Harrah; and he was pitched over the western precipice. Fortunately, the 120 or more feet of rope were neatly coiled; and Harrah fell the entire distance, giving Maxwell time to grab his axe as it, too, started to fall, throw himself prone on the ridge top, and drive the axe into the snow. (There are arguments both pro and con jumping over the other side of the ridge.) Fortunately also, the pull was straight down, rather than outward; and the rope sawed into the snow, acting as a dynamic belay. Harrah, though festooned with pitons, crampons and axes, was not punctured by them, because he fell free about 50 feet and then hit nothing worse than 75-degree ice. Aware of being battered by falling ice blocks, he realized vaguely that this was what the Alpamayo accident must have been like, that this was going to result in two deaths, and that this was the nemesis for ***hubris.***

Without surprise, without gratitude, he felt a sickening jerk at his middle. The stretch in the nylon had absorbed much of the shock; his ribs had absorbed the rest. Atop the ridge, Maxwell had been jerked forward three times. Between two of the jerks, he had had to pull out his axe and drive it in again farther forward. A fourth jerk would have pulled him over, for by that time his hands were six inches from the edge. All of this had taken place in less than three seconds.

"Slack!"

"I can't help you."

Looking down, Harrah could see the sunlit ice flutings ending in an overhang a hundred feet below; beyond the overhang he could

see only the glacier, already in shadow, 4000 feet below. With an automatic desperation, he dug his two axe-claws into the ice and began working upward, sometimes without footholds, sometimes able to place his crampons on opposite walls of an ice fluting to rest for a moment or to stem upward. In about 45 minutes he reached the crest of the ridge, rather tired and expecting to cough up his ribs, piece by piece.

"We're in for it."

One of Maxwell's gloves had gone down; it was replaced by one of several extras carried for an emergency. The two climbers shortened leads. Presently, just as Maxwell jumped back, another cornice went down. Harrah's ribs were giving him some pain, and he was beginning to experience the "extra man" delusion. They climbed so cautiously down the rocky corner that it was dark by the time when they arrived at the safe climbing on the broader ridge. Harrah held that there was enough moonlight to see by, that on the ridge they could not get lost, and that they should keep moving while they had the strength. Maxwell held the opposite views, and twice stopped for half an hour to dig an ice cave. It was during these delays that the major injury from frostbite occurred.

At midnight they were at the western end of the ridge crevasse, barely one hour above the high camp. They had not the strength, however, to descend the final steep slopes with safety. Beneath an ice chockstone in the bottom of the crevasse, Maxwell found an ice cave, cramped but warm. They crawled in and removed their boots. Since Maxwell's socks were dry, he wrapped his feet in his parka and relaxed, resignedly. Harrah's feet had become soaked from trail-breaking, and his socks had been frozen on the slow descent. Here was the major defect in equipment: gaiters would have kept the snow out of his boots,[5] and extra socks are essential in even the lightest pack. It is certain, however, that even with gaiters some frostbite injury would have been sustained. Harrah wrapped his feet, and thawed and dried his socks over a candle flame. (Try doing this with a flashlight!) At this altitude the Peruvian-made matches refused to light. What did work were the tallow-coated matches Harrah had carried in his emergency "junk bag" since 1942.

At 10.00 the next morning they crawled out into the sunlight and,

[5] Tricouni makes a type to fit all boot sizes.

YERUPAJÁ: NORTHEAST FACE

*Photo, A. F. Riggs*

in an hour, were at the high camp. After brewing hot lemonade, they sank into a stupor, too far gone to bother with foot-massage. Harrah wished that they had brought morphine instead of the ineffective demerol. Twenty-four hours later they forced their swelling feet into their implacable boots and began packing for the descent. Through rifts in the clouds they saw their four companions on the glaciers far below. Shouts of "Help!" were acknowledged by the four, who had last seen the pair of climbers as they disappeared upward in the fog 54 hours before. They guessed correctly that Harrah and Maxwell were having trouble with their feet, and determined to start up the following day. In this tenuous support of those high by those below lay the gravest organizational defect of the expedition: an automatic relief system should have been worked out in advance.

Harrah and Maxwell started down, carrying sleeping bags as insurance against disaster. Maxwell had to rest every 25 steps. Route-finding in the fog took Harrah's mind off his ribs. Below the cloud level they shouted again, and their companions met them on the slopes above the col in a most welcome reunion. Maxwell stayed at the col that night; Harrah went on to the glacier camp. On the following day Matthews (who had almost not accompanied the expedition, because of a knee operation in the spring) performed a walker's *tour de force*—from the glacier camp to Chiquian in one day, accompanied from Base Camp by Sack. They arranged for mules, and for a taxi to transport Harrah to Lima.

A danger of frostbite is that the feet will "come to" and be too painful to walk on, that they will swell beyond boot size, and that infection will set in. Harrah's feet never "came to," and Crush's expert application of Borofax dressings kept out infection; but Harrah had to walk to Base Camp in boots three sizes larger than his own. After two days on mules and a nine-hour taxi ride, Crush deposited Harrah in the Clinica Anglo-Americana in Lima on August 8th. Since Maxwell's feet were less seriously injured, he came out a week later with the rest of the expedition. The Clinica and its American surgeon, Dr. Ned Raker, were excellent. Harrah lost all his toes; Maxwell, half of three toes. The difference may be attributed to the fact that Harrah's feet had got wet, and that he had deteriorated, through lack of oxygen and malnutrition due to loss of appetite, for a longer period than Maxwell.

Before, during and after our climb, the press emphasized the sen-

JIRISHANCA BY TELEPHOTO

*Photo, A. F. Riggs*

sational aspect of it: the mountain was "Butcher of the Andes." Perhaps this sort of thing is inevitable in the case of a spectacular accident on a spectacular peak. Such publicity, however, is harmful to mountaineering in general—and, in particular, to the members of the expedition, whose attitude from first to last was that safety must come first. We realize that we climbed on the shoulders of Schneider, and that good luck with the weather and snow conditions was the major factor in our success. Most important, we realize the value of the lessons learned concerning equipment, cornices and support-systems. We hope that these lessons will benefit others besides ourselves.

D.H.

# New Routes on Mount Waddington

Richard C. Houston

CLOSER and closer we came, until at last the sturdy Norseman's pontoons scraped the water and then, with a billowy splash, came to rest on Ghost Lake, deep in the coastal mountains of British Columbia. Three hours before, Al Steck and I had breakfasted together in Vancouver. Now we were here at last, near Mount Waddington, the highest peak in British Columbia. The date was 14 July 1950. For the next six weeks, with our six friends who were awaiting us, we were to be very much on our own. As the plane lifted gently from the quiet waters, we wondered what these weeks would bring. We knew that all of us had worked intensively on plans for the trip; we had checked, so far as we could tell, every last detail. Despite our knowledge that we should certainly encounter climatic and logistic problems, we were not without confidence. Still, there were questions on our minds. Had our air drop been a success? Would the equipment prove satisfactory? Would our food be adequate? Finally, would Waddington yield to our assault?

But let me go back to the beginning, and introduce the characters of the piece. Oscar Cook: veteran of the Sierra Club's 1947 trip to the Coast Range, always the thinker and generally ready with a new name for a col or a peak. Allen Steck: recently returned from the mountains of Europe, and prepared for this trip by his five days on the north wall of Sentinel Rock, in Yosemite Valley.* Bill Long: our youngest and strongest, always willing to carry that extra pound or two. Bill Dunmire: newcomer to ice and snow, but ever eager and ready. Jim Wilson: our calmest—one who takes everything in stride, even a fall into a crevasse. Phil Bettler: bearer of our largest and heaviest camera. Ray de Saussure: without a camera, but never without a pocket slide rule. Myself, Dick Houston: another picture-taker and participant in the Sierra Club trip of 1947. All hands are members of the Sierra Club, and five are members of the American Alpine Club.

We gathered in Vancouver on July 10th and spent two frenzied

*See pp. 168-70 below.—*Ed.*

days, with headquarters in a hangar of the Queen Charlotte Airline, completing our arrangements. Our plan was simple. On July 12th six men, with their packs, would fly in to Ghost Lake, near the junction of the Tellot and Homathko Canyons. Two days later, a second flight would drop about 1000 pounds of supplies on the Tiedemann Glacier and then land the other two members of the party on Ghost Lake. By Tuesday, July 11th, with the aid of Mr. S. T. V. Jeffery, of the Canadian Pacific Railroad, we had completed arrangements. The weather had been perfect; but few stations near Waddington give reports, and little can be judged from ordinary reports. At dinner time we checked with the airline. Things seemed almost too good: it was not like Waddington to offer such fine conditions. We hoped that they would hold for at least two more days.

Wednesday morning arrived. Yes, the weather had turned, but the ceiling was still high, and the visibility good. This was in Vancouver, to be sure, and not 180 miles to the north. But Johnny Hatch, our Q.C.A. pilot, seemed none too worried. As we dragged the six packs aboard at 6.00 A.M., he merely observed that, since only five ice-axes had been loaded, we must have forgotten one. The axe was found; the Waddington-bound crew clambered into the small, neat cabin; the Norseman lifted itself from the water and winged its way toward Ghost Lake. Al Steck and I were left on the dock, but we knew that our turn would come two days later.

Al and I returned to the big Kelly Douglas wholesale house, made ready the last boxes for the air drop, moved them to the airport—and settled down to await the return of Johnny Hatch. About 8.00 P.M., having made a second flight to the north after the landing on Ghost Lake, he came in to the dock. Al and I, besetting him with questions, must have sounded like two schoolboys. "No trouble, except a little rain. Overcast much of the time, but clear enough to see the main peaks. No, we never saw the top of Waddington. Yes, we looked over the dropsite on the Tiedemann Glacier, and it seemed O.K. Yes, the lake was plenty big enough." The main thing was that the six members of our party had landed on the shore of Ghost Lake. Four of them—Bettler, Cook, Long and Ray de Saussure—would now climb out of the basin and proceed to the snout of the Tellot Glacier. Thence they would go over a low pass, visible in pictures taken in 1947, to the Tiedemann Glacier and the dropsite.

This, we estimated, would take two days if all went well. Dunmire and Wilson would wait for Steck and me at Ghost Lake.

Friday the 14th finally arrived. We stowed 31 bundles inside the cabin of the plane and at 9.55 A.M., with Len Frazier, chief pilot of Q.C.A., took off for the dropsite and Ghost Lake. We climbed steadily to 9000 feet and, riding above a patchy cloud layer, flew up the coast to Bute Inlet. Here the immense mass of Mount Waddington burst into view. Still 50 miles away, the peak looked like a great beacon in the sky. From the inlet we passed to the main canyon of the Homathko. Peaks were visible in every direction. Just at noon we turned up the Tiedemann Canyon, and quickly we were over the 15-mile-long glacier. The three of us strained our eyes to see human figures on the vast expanse of snow below us. We flew to within a mile of Waddington and made a lazy 180-degree turn. No welcoming party. Had they not succeeded in reaching the glacier? Another turn at the snout of the glacier. We were about to decide on a dropsite by hand signals in the plane when the four dots were sighted. They spread out somewhat as we made four runs down the glacier at about 200 feet. I pushed and pushed, and finally achieved a record of nine boxes out of the plane on one run. The air drop was over. We soared over the pass into the Tellot Canyon and sighted Ghost Lake—a small, oblong affair, a mile and a quarter by half a mile. With little wind, we landed to the southeast and taxied to the west end to find our friends. They greeted us heartily. So did several thousand mosquitoes. The plane disappeared into the southern sky.

We left Ghost Lake at 12.20 P.M., to push our way up to the ridge, 500 feet above the lake. We were alone now, with only ten days' food, which each party carried for emergency. We had our first shocks when we discovered that the Canadian forest is indeed dense and that an 80-pound pack really weighs 80 pounds. When we attained the ridge, we could look down into the Tellot Canyon. Staying high above the canyon's floor, we located a campsite at dark about a mile from the snout of the Tellot Glacier. Night was welcome, for the mosquitoes then quieted down somewhat. From this 3300-foot camp we walked across our first ice of this trip, then left it for the brushy northern slopes leading to the 5000-foot pass into the Tiedemann Canyon. We were on this beautiful wooded pass (which we named "Nabob Pass") at noon. For the first time

we could see a few of the peaks on the south rim of the Tiedemann Canyon—Merlon, Fascination, Marcus Smith, spread before us in their alpine glory. We crossed the partly snow-covered pass and started the steep, quick descent to the glacier. Having hit the lateral moraines and proceeded onto the snow and ice of the glacier, we soon made our next discovery: distances become exceedingly long on this ice river, and minutes drag into hours, and still there is no sign of the base camp near the dropsite. Finally, at 8.00 P.M., we heard a yodel and sighted a flare—and pulled ourselves into camp.

During a leisurely dinner we heard the story of the advance party. They had left Ghost Lake and proceeded to Nabob Pass; and by the second day they had been camped here, awaiting a break in the weather, which was very poor and made the air drop seem unlikely. But on the day of the drop the sun had broken through; and the four had rushed down to the Tiedemann and pushed up, with as much speed as 75 pounds would allow, to a suitable dropsite. Here we had spotted them at noon on Friday. The packages had survived remarkably well, and none had been lost. Only the margarine had suffered: it had oozed through the cardboard, but quickly been recovered with a large spoon. Even the five-pound milk cans had remained intact through the 200-foot drop.

This night we held a conference and decided, because of the extraordinary weather, to attempt Waddington immediately. This meant organizing camps and food. After much deliberation we split into two groups of four for the push to a high camp on the mountain. Steck, Long, de Saussure and Wilson would go tomorrow, and the rest a day later. This plan would allow the second group some time to organize the base camp. We pitched our nylon tents on the snow, but had an excellent rocky area for food storage and cooking.

The next day dawned bright and clear, and preparations began. Each party was to take ten days' food and supplies. At 9.00 A.M., the first group left for the peak, planning to cross the snow of the upper Tiedemann to the steep snow slopes south of Bravo Peak. The distance was three or four miles. We watched as they moved across the glacier, at what seemed a snail's pace. At lunch time they had just started up the snow leading to Bravo Peak. Laboriously, they weaved and turned through the multitude of séracs and crevasses. Though slow, their progress was continuous; and by

8000-FOOT NORTHEAST FACE OF MOUNT WADDINGTON
Route is indicated, with B marking Bravo Col Camp (10,000 ft.) and H marking High Camp (12,200 ft.). At the top, the routes are on the southeast chimney (left) and north face (right). To the left, lower than Waddington, are the summits of Spearman Peak and Bravo

*Photo, O. A. Cook*

H

6.00 P.M. they had reached a severe headwall below and south of the col between Spearman Peak and Bravo Peak. Here the advance slowed perceptibly. The leader crossed the bergschrund and then kicked about 400 feet of steps in the high-angle snow. This direct attack on the headwall enabled the entire group to reach the brink of the wall at 10.00 P.M. In dwindling light camp was made on the snow at 9500 feet, just below the Bravo-Spearman col.

At dawn on July 17th our group of four made ready to follow. The weather was still perfect, with hardly a cloud in the brilliant sky. Our progress across the upper reaches of the Tiedemann Glacier was slow but constant. The snow was no longer frozen, and each step broke beneath the leader's foot. In an hour and a half we had covered the distance to the main slopes of the mountain directly beneath Bravo Peak. Now the work really began. The snow was soft, and the slope was steep. We turned a small outcrop and surmounted a 500-foot rise to a saddle overlooking the entire Tiedemann Glacier. Here we rested and ate our meager lunch of nuts, cheese, candy and fruit. As the afternoon sun shone relentlessly down, the going became slower and more exhausting. Our route followed a zigzag course, upward toward the big headwall to the left of Bravo. Once below the headwall, we could see the troubles encountered by the first party. We, as they had done, chose the direct attack on the 50-degree snow slope. Even though avalanche danger was apparent, this appeared to be the only route upward. I led on and over the schrund and moved upward toward the top of the headwall. Oscar Cook followed on the rope as we exchanged leads on this ticklish portion of the slope. Even normally secure ice-axe belays seemed totally inadequate on this section. Time dragged on, and at 7.00 P.M. we had finally surmounted the headwall and looked forward to camp. We found the first party's campsite below Bravo Col at 9500 feet. Here, tucked in by Bravo and Spearman, we pitched our cold but welcome tents. So far we had not seen the others and hoped they had reached a satisfactory high camp far above us. The stillness was interrupted only by the occasional avalanche, sometimes close at hand and sometimes in the far distance. Only late at night did the rumbles stop entirely.

It was Oscar who first spoke again. For several minutes I, too, had been listening to the soft patter of snowflakes on the tent. Was this to be the turning point? Would we have to fight the weather

BRAVO COL CAMP (10,000 FT.)
Mount Munday towers to the south

*Photo, P. C. Bettler*

from here on in? There was a little gloom while we cooked and made up our packs. The mist was all about us, but as little snow was falling we decided to push higher. At 11.00 A.M. we moved on and presently confronted one of the largest crevasses on the mountain. In the gray gloom the route was neither enticing nor even apparent as it led along a small snow arête beneath the lip of the schrund. The leader, Bettler, moved out of sight. Finally, he and Bill Dunmire came into view above the schrund. Cook and I followed and found the key to the crossing was a step from our snow arête across a thin snow bridge. It was lucky for us that the bridge existed, for the crevasse dropped off toward the Tiedemann Glacier just a few feet from the bridge. We dumped our loads at Bravo Col (10,000 ft.), and decided to camp after gaining only 500 feet. In the mist and clouds the summit of Waddington was hidden. We hoped that our friends were safe high up in the storm. In a slight snow, we pushed up the 500 feet to the summit of Bravo, an easy snow walk. The view did not exist. A small remainder indicated that our other party had also made the summit. We returned to our tents and awaited better weather.

The winds finally subsided, as did the snow, during the night. The weather was again in our favor. Waddington stood out in all its glory, with a cover of fresh snow and a snow banner trailing to the south. Suddenly a cry from above. There they stood: three—no, four—tiny dots against the peak, on the last bit of snow before the rock. The next six hours we spent in a big struggle with snow, both steep and soft. At 7.00 P.M. we crossed the final bergschrund below high camp and were greeted by the others with warm soup and rice. The camp was excellently situated at some 12,200 feet. Only a short upward trudge remained to the final 1000-foot rock summit of the mountain. Our site was almost handmade, it would seem. Two large level spots provided adequate space for every activity. Close at hand was the snow cave that Steck and Wilson had dug out during the height of the previous day's storm. They had found the cave much snugger and warmer than a zelt-sack during the poor weather.

Today had been reconnaissance day for the first party. With clear but windy weather, the four had traversed to the notch between the main summit and the unclimbed southeast rock tower (12,900 ft.) of Waddington. This notch, only a few hundred feet

below the true summit, opened to a high-angle chimney on the southeast face of the final tower. Steck made a short lead into the chimney and then retreated because of difficulty and the lateness of the hour. This route seemed possible, but looked difficult: it might involve many pitons and some 700 feet of rock and ice climbing. It was considered that the north and east faces should be examined for a more practical route to the top of the mountain. Tomorrow was voted a full reconnaissance day for everyone. The weather calmed down, and we were hopeful of another perfect day.

A slight breeze greeted us when we awoke and emerged from our tents and ice cave. The sun was up, and the great rime ice on the summit tower shone in the morning light. The group split into three parties. The first was to turn the southeast rock tower on the south and attempt to gain the western side of the main summit. This enterprise proved futile: the western face of the rock tower seems indeed impossible. About noon we returned to the large snow bench running the full length of the east side of the peak about 1000 feet below the summit. There the others had already arrived, and a suggestion of defeat was apparent in everyone. The north face looked little better, even in this perfect weather, than the southeast chimney. The main problem seemed to be how to overcome high-angle ice and rock with few belay positions. This did offer some promise, however, and after much discussion we picked out a feasible route—of sorts. Possibly we were reluctant to admit that this route would not go: it was almost exactly the route attempted by Roger and Ferris Neave and Campbell Secord in June 1933. On this attempt they had proceeded from the Tiedemann Glacier and camped at Bravo Col (10,000 ft.). It was from here, in very poor weather, that the trio had attempted the northeast face. Despite the storm, they reached a point about 800 feet from the summit, only to be turned back by ice and foul weather. With this in mind, we decided that one group should take this same north face route. On investigation the notch between the main summit and the northwestern snow summit proved also very unfriendly and offered little chance of success. Only two routes seemed open: the southeast chimney, and the once-attempted north face. Returning to camp that night, we felt much new respect for this, the highest mountain in British Columbia. About 9.00 P.M. Bettler and Steck returned from a short reconnaissance on the north face. They had cut many

steps up and over the bergschrund to the rock. Everything was in readiness for the big push tomorrow if the weather cooperated. We thought of the 16 unsuccessful tries before the first ascent from the west in 1936, and wondered whether the northeast face was to prove as elusive.

The night passed quickly. At 4.30 A.M. on July 21st, we climbed out onto the frozen snow with the temperature near 22°. A cold breakfast seemed even colder with frozen chocolate and dried fruit. We split into our two climbing parties: Oscar Cook, Ray de Saussure, Bill Long and I decided to have a try at the southeast chimney; and Phil Bettler, Bill Dunmire, Jim Wilson and Al Steck would take to the north face. Each party carried two nylon ropes, ten to 15 pitons, and five or six karabiners. The weather was ideal, with few clouds and not a breath of wind. The gods were indeed smiling. The eight of us left camp at 5.15 A.M. and split a few minutes later, with our party crossing the schrund and following the old snow steps to the rocks directly below the southeast rock tower. We looked down as the others disappeared around the corner to the sheer north face. We turned our attention to the problems before us.

From our position directly below the rock tower, we traversed directly upward and northward to the notch between the main summit and the rock tower. The climbing was all roped, with three pitons for anchors and one for safety. At 9.30 A.M. we arrived at the notch. A brilliant sun warmed both the rock and our hands. We had roped into two two-man parties: Bill and Oscar, Ray and me. The traverse involved some six pitches, each of about 70 to 100 feet in length, over alternate rock and hard snow. From the notch a great, cold, ice-filled chimney curved downward out of sight to the west, indicating that there would be little chance of access to this point from the western side. We were glad to avoid this nightmare.

Directly above us rose the final 600 feet of rock and ice. The route was unusually apparent and not very encouraging. The chimney was ice-filled at spots, and three large chockstones blocked upward progress at intervals. Bill led off and came to grips with probably the most crucial pitch on this route: a large slab with a small series of cracks offered a way around the first and largest overhang. Bill tried once, twice—and finally, after much encouragement, succeeded in pulling up a long step on minute holds to more

secure cracks. Two pitons were used at this point for safety. The ascent seemed infinitely more possible after we had passed this portion of it. The second stone was also turned to the right, but required several pitons for protection. A slight amount of ice tumbled down from above, but four pairs of alert eyes kept constant watch for the sake of those below. The third overhanging chockstone loomed above, but again an alternative route existed: a difficult pull-up, followed by a delicate traverse, brought us to a very rotten rock-and-snow ledge at the top of the 300-foot chimney. The climb seemed ours. The angle decreased perceptibly. The exposure lessened also, but loose rock and soft snow indicated that pitons were still necessary for anchors and protection. We moved into a wide, shallow, snow-covered gully only a few feet from the sheer northeast face of the mountain. With rock-anchored belays, the leader kicked steps upward. We now were slightly above the southeast rock tower, which loomed in the sky like a giant rock finger. The summit must be close at hand. Two 100-foot leads placed everyone on a broad snow face. Rime ice jutted everywhere, shining brilliantly in the bright sunlight. The snow had hardened and covered the rocks only inches deep. Bill Long led on as everyone donned crampons. Once again the ice-axes proved valuable; the disadvantages of carrying them during a rock climb were forgotten.

As Bill paused on the skyline, we suddenly realized before he spoke that this indeed was the summit we had sought so long. We had completed a new route on Waddington and made the third ascent of the peak from any side. Long belayed from just below the summit, and each in turn came to the very top. It was 2.30 P.M., bright, clear, little or no wind. Even the customary clouds had dispersed on this grandest of all days. All of British Columbia was below us. Base camp could be spotted 8000 feet below, a dot on the Tiedemann Glacier, which stretched out to the east. The Franklin Glacier's great sweep to the west could be seen, and peak after peak in every direction. Lunch was produced, and food once again became important. The summit cairn was strangely missing. A thick coating of snow on the summit probably hid the tube register (Wiessner's) and cairn. We signed a small paper and placed it in a plastic container of our own. This we placed in a group of loose rocks exposed from the snow just to the north of the actual summit and a few feet below it. This was probably very near the first cairn.

As we made haste for the difficult descent, a series of yodels and shouts attracted us. Turning northward, we saw a wonderful sight. Our other four were on the north arête, only a hundred feet below the summit. We exchanged a few words and decided against waiting for them on the summit, because of the lateness of the hour. We left with the feeling that they would easily reach the summit in short order. We roped together again: Oscar and I, Ray and Bill. When we reached the chimney, the sun was hidden behind the lower southeast rock tower, and ice once again took over the sides of this high-angle chimney. In three long rappels, we easily reached the cold, icy notch. The chimney above again looked unfriendly. With the ice now replacing the water, we wondered whether this route could be completed in cold or cloudy weather.

We finished the traverse to the snow above high camp in the cold dusk and at 10.00 A.M. threw down our equipment and turned for another look at the peak. We listened for a sign of the other group, but none was forthcoming. At 11.00 P.M. we cooked dinner and relaxed for the first time in 17 hours. It was hard to remember when a meal had been so satisfying and enjoyable. The temperature dropped to 26°; and we hoped the others would have a fairly warm night on the mountain, as we had given up hope of their arrival that night at high camp. We all slept well and soundly, but at 5.00 A.M. a great commotion awakened us. The others had returned after an all-night descent from the summit, which they reached shortly after we had started down!

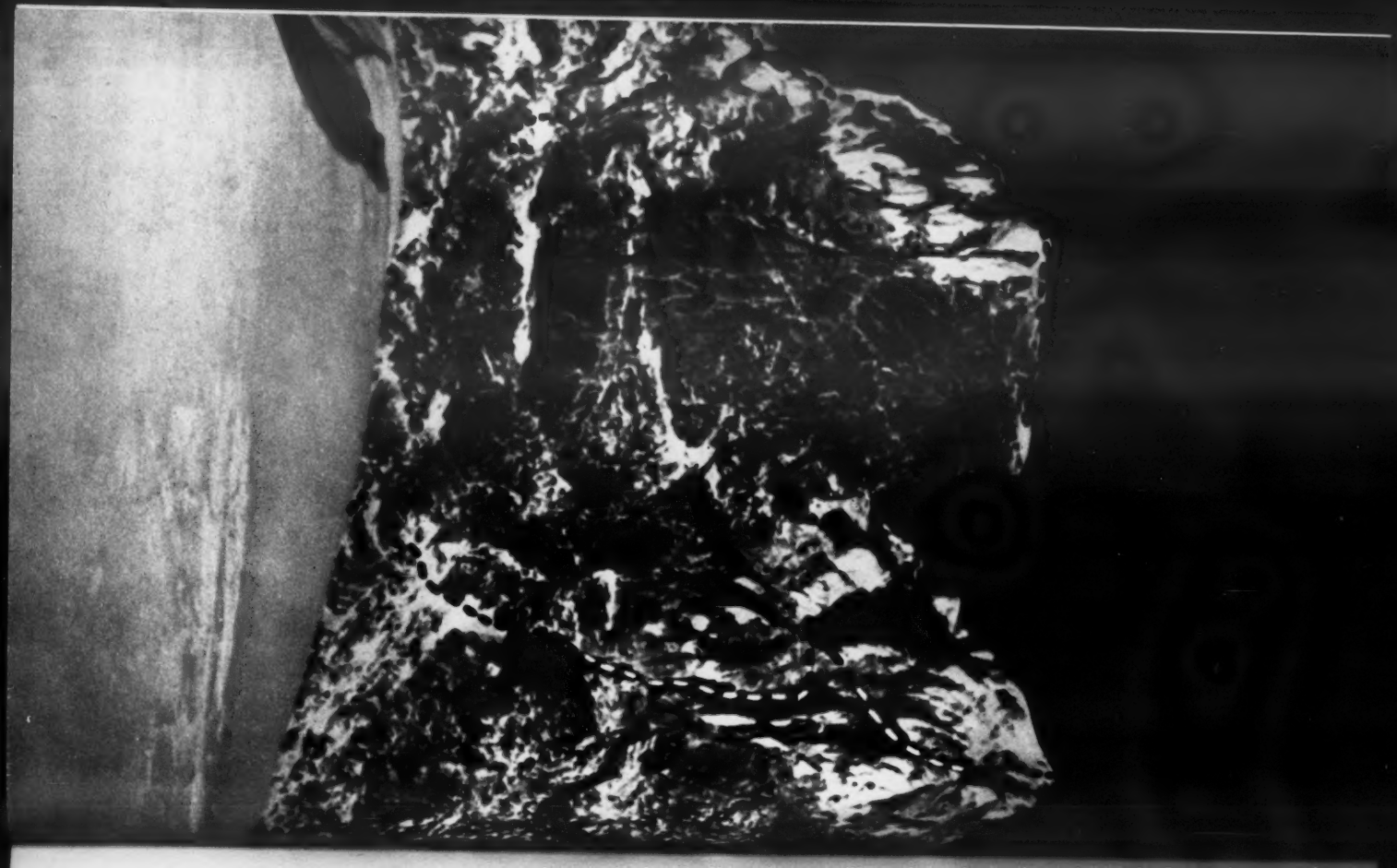
Phil Bettler tells their story:

"After the trudge from high camp we stopped just below the bergschrund to rest and to tie into our ropes. Looking back, we saw that the other party had already left camp and were on their way. The sun was just rising over the peaks to the east. The sky was clear and calm. We thought to ourselves that this was our day. Surely one of our parties should reach the top if it was at all feasible from this side.

"Taking the lead, Jim and I retraced the reconnaissance route of the afternoon before; up over the lip of the bergschrund, along a wide rock ledge to our right, and around the corner onto a snow field on the northeast face. After cutting and kicking steps a few feet up the snow patch, I placed an ice piton; and Jim led on past, cutting steps diagonally up to the right for better than 30 feet. Then

FINAL 3000 FEET OF MOUNT WADDINGTON FROM SOUTHEAST
H marks High Camp (12,200 ft.). The southeast chimney route is on the left; the north face route, on the right

*Photo, P. C. Bettler*



he gained the rock again; and, alternating the lead, we traversed to the right for another 300 to 350 feet, sloping gradually upward all the time. The rock was solid and the handholds were good, making the climbing along this stretch rapid and enjoyable.

"At the end of the traverse we encountered more snow and ice. This was to be our lot for the rest of the climb: alternate patches of snow and ice and then solid rock, sometimes not so solid. With the high angle prevailing, we had to use our utmost skill and care. Those below were often showered by the chips falling from the busy ice-axe of the leader.

"A little farther on we cut back slightly to the left, up a rather open but nearly vertical chute or chimney. Jim took the lead. Just a few feet up, the rock became very loose and treacherous. Not liking the exposed position of my belay, he anchored himself to a piton and called for me to come up and join him. I took over the lead and started up. Jim's fears had been well-founded, for almost every rock that I tested for a handhold seemed to be loose. Once I reached out to test a large block; and, though no force at all had been applied, it tried to come out. I held my breath, gently pushed it back in place, and tried another. I went on, sometimes depending on the direction of the pressure on a rock to hold it in position as I used it for a handhold or foothold. Somehow I reached the top of the chimney without annihilating those below.

"Shortly after this, Bill and Al, who had been following close behind, took over the lead. It was now a little past noon, and we were a little better than halfway toward the ridge. The climbing, although exacting and somewhat arduous, was enjoyable, for the day had remained almost perfect. There were a few clouds in the distance, but overhead the sky was clear and blue. There was almost no wind.

"We continued up. When the rock was bare, the climbing was rapid. The patches of ice and snow slowed us a bit, but they were quite solid and did not present any great difficulties and dangers.

"We reached the ridge about 3.30 P.M. There before us was the summit, about 200 feet away and 50 feet above. The final pitch was a snow-filled chimney which chilled our hearts, for it did not look any too easy. It was getting late, and we should have to hurry if we hoped to get back to camp before dark. Al and I were determined to go on. Bill and Jim elected to remain on the ridge,

FINAL 1000-FOOT ROCK TOWER FROM HIGH CAMP (12,200 FT.)
Left, southeast tower; right, southeast chimney

*Photo, A. Steck*

giving the two of us a chance to make the top in good time.

"I tied into Al's rope, and we quickly traversed along the ridge to the base of the chimney. Our hearts sank. Before us was a six-foot gap better than 30 feet deep. It seemed that we could not possibly span it without consuming too much time and effort. But Al placed a fixed rope and, with the help of a tension belay and with much straining and struggling, managed to step across to a small knob on the far wall. The final chimney proved easier than expected, and we were on the summit at 4.20 P.M.

"We paused to look around and to take pictures. The sense of achievement and the magnificent view elated us. But we could not tarry long. The trip down was still before us, and the hour was late. Hurrying back to the others on the ridge, we set up a rappel and started down, the flush of victory still on us, but looking forward now to the well-earned comfort of our sleeping bags.

"The day was still perfect. On the ridge the breeze fanned us gently; but, as we dropped below, all was calm again. The light began to fail as we reached the long traverse. Here we had to leave off rappelling and climb down the rest of the way. The darkest part of the short night we spent negotiating the snow patch at the end of the traverse. The light began to come back into the sky as we reached the bergschrund. We were back in our bags at 5.00 A.M., just 24 hours after we had left them."

Thus had our most ambitious dream come true: our entire party had stood on the summit of Mount Waddington, having accomplished two new routes on the final tower.

# The First Ascent of Mount Erasmus

JOHN C. OBERLIN

BACK home after vacation in the summer of 1949, I had not been too sure that I would care to pack in to Mount Erasmus.[1] The 2500 feet of steep bushwhacking with heavy packs which Bob Bishop and I had put in to reach our high camp were still fresh in memory.[2] As the winter progressed, that memory faded, while the problem posed by the mountain continued to be teasing. Dr. Thorington had raised a question in 1941: "Why, Canadians and others, was Mt. Erasmus (10,700), standing just across the road not tackled before the North Fork bridge burned in 1940?"[3] Bishop and I had found only one possible flaw in the final cliffs, and that had seemed most unattractive as a route of ascent. Still, it might go.

Bob had other plans for the summer of 1950; but my climbing companion of several past seasons, Fred Ayres, of Portland, Oregon, who had previously expressed interest in the peak, agreed to meet me with his station wagon at Lake Louise Station on July 16th. In due course, we were driving up the highway to Saskatchewan Crossing. After checking out with Warden Black, we made up our packs and at about 5.00 P.M. hoisted them onto our backs with appropriate groans and started off along the Howse River trail. This trail is now in excellent condition, and we had nearly reached the deserted cabins on the sand hill when a heavy shower descended. It was then 7.00 P.M., so this seemed a good spot to camp for the night.

Next morning was only partly cloudy, and as we hiked along the trail we could see the lower portion of the big rock tower to the north of Glacier River. It did not appear any too climbable, and Fred looked skeptical when I told him I thought we could probably get up it from our high camp. Fording the Howse River required considerable zigzagging, but so much of the afternoon remained when we reached Glacier Lake that we both felt we should push on to high camp in the little hanging valley below the tower. Fred was the more

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[1] The mountain is named for Peter Erasmus, Dr. Hector's Indian guide, and last survivor of the Palliser Expedition.—*(Data supplied by Dr. J. M. Thorington).*

[2] R. H. Bishop, III, "Reconnaissance of Mt. Erasmus," *A.A.J.*, VII (1950), 529-30.

[3] *C.A.J.*, XXVIII (1941), 56.

enthusiastic of the two since he had not made the trip the year before.

After proceeding a considerable distance along the flats beyond the end of the lake, one turns uphill and proceeds to bushwhack through tangles of fallen timber, up a small but wet cliff, and then up a series of ridges between ravines while working to the right (east) in an attempt to emerge on the shoulder of the little valley. The vertical ascent is 2500 feet, and the slope from above the little cliff is very steep all the way. When we finally dragged ourselves out of the last of the timber and looked over the shoulder into the hanging valley, it was nearly 8.00 P.M., but at least we had come out at the right spot. This was just as well: we were dead-beat and agreed that no early start for anything would be made next morning.

The valley itself is a beauty spot—meadow and heather, with here and there patches of dwarf spruce, and a fair-sized stream splashing along between banks of snow toward its steep-walled exit gorge. The rock tower, here seen to be a ridge, rises on the far side and discloses the only chink in its armor. The encircling cliff, for the most part unclimbable and frequently overhanging, is broken down into a narrow scree funnel at one point on its south side. After a leisurely breakfast we headed up toward this.

Despite our comfortably slow pace, we soon found ourselves clambering up the summit ridge and were prematurely congratulating ourselves when the last few feet disclosed that the true summit was still a long way off—at the extreme eastern end of the ridge, in fact, and separated from us by several apparent gaps. The north side of the ridge is a spectacular cliff, but the crest proved an easy walk and the gaps non-existent. Shortly we were relieved to find ourselves on the undoubted summit. The sun shone on our efforts and the surrounding countryside.

No sign of any previous ascent being discernible, we resolved to build a cairn large enough to be seen from the Howse River trail and amused ourselves for some time at this strenuous and rather ridiculous task when we might just as well have been dozing in the sunshine. All the same, we were quite proud of the edifice.

The next day was showery, and Fred was forced to spend it nursing a heavy cold he had acquired from me. He was still convalescent on the following day, which was again perfect, and dragged his air-mattress out into the sun in order that he might soak up a few

extra vitamins. This also exposed him to unexpected hazards. Upon my return from a photographic scramble I found he had suffered a serious attack of marmotry. The air-mattress had sustained three punctures where the marauding rock-chuck had indulged a newly-acquired taste for rubber, and little piles of rock ammunition heaped about in all directions gave evidence of counter-measures taken. Adhesive tape was only partially successful as patching material.

Next morning we arose to a cloudless sky and, after again registering surprise at this unusual clemency on the part of the local weather, set forth up heather slopes and snow tongues toward the scree col separating our peak of several days ago from the main ridge which culminates in Mount Erasmus.[4] Last year's exploration now paid off, and we turned promptly up the short ridge extending to the west from the col. When this reared up into a jagged tower, we followed the well-designed goat highway around to the left and into a long gully, filled with snow. Again arriving on the ridge, now above the tower, we continued upward to a snow patch which we traversed to the left, arriving thus at the end of a series of commodious ledges. The goats had worked out a most complex but not at all capricious route from one ledge to the next. We followed this with delight and admiration. When the trail finally ran across the nearly sheer face of the cliff to a notch in the main ridge, we preferred to continue directly upward to the crest, noting with satisfaction that at least one goat had also balked at that exposed traverse.

The view of the Lyells from the crest was most handsome, the whole sweeping ice field being visible. The ridge running toward Erasmus has a cap of curious bulbous projections resembling some fossilized giant seaweed, and a layer of similar knobs extends at the same level across the southwest face of Erasmus just below the final cliff.

Dropping down on the west side, we traversed easily to the notch and there rejoined our goat trail, which led across snow and scree to a scree ridge banked with snow, up which we kicked steps. A tedious traverse below the upper Erasmus cliff, involving the crossing of a number of steep snow gullies, finally led us to the cleft we were seeking, just as I was beginning to share Fred's doubts that I had ever really seen it.

[4] In the note in *A.A.J.*, VII (1950), 529-30, this col is erroneously stated to be immediately W. of Sullivan Peak. Actually, Sullivan Peak is considerably farther W.

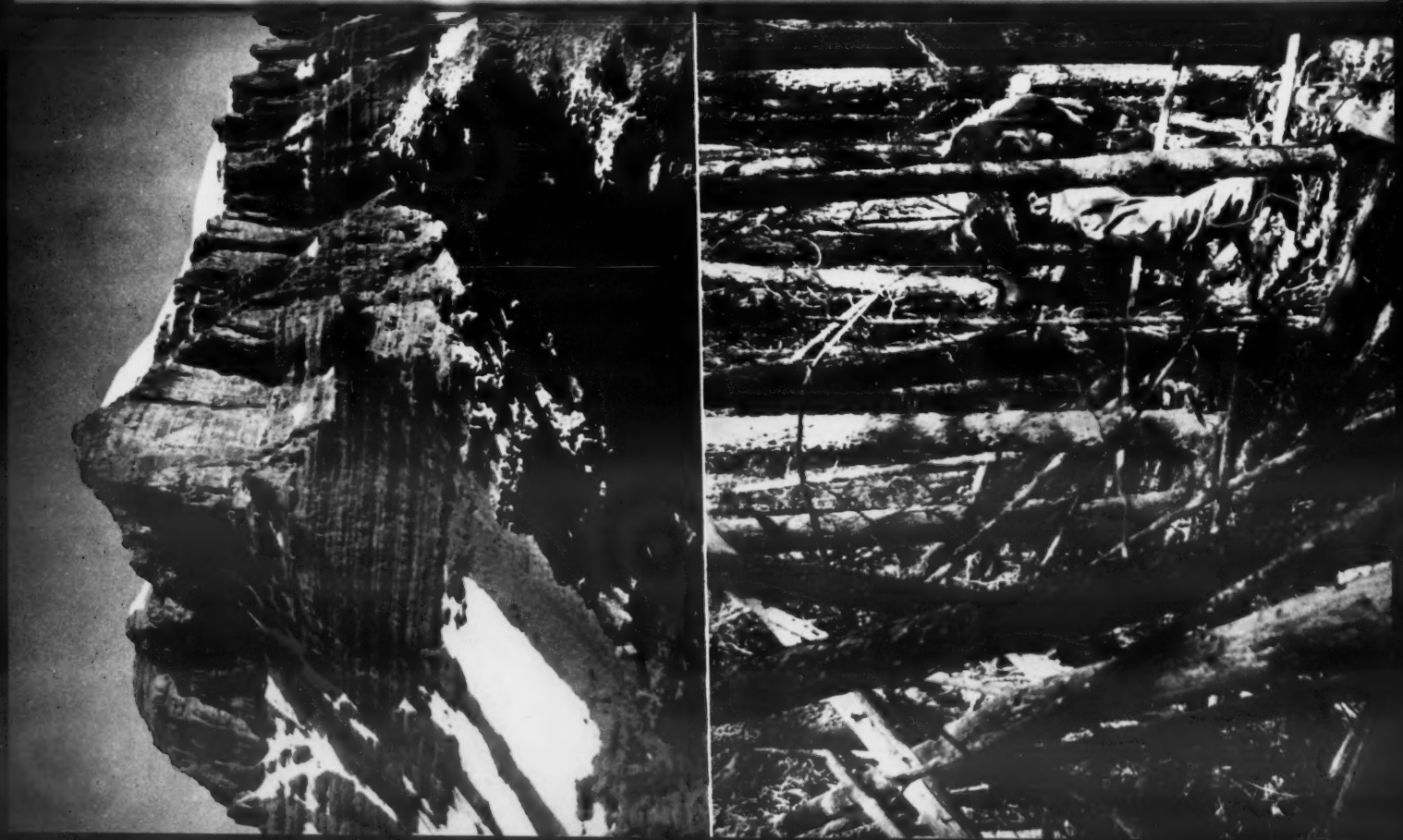
This cleft is formed by two steep, sometimes overhanging waterfall gullies or chimneys separated by a rock rib. The right-hand gully seemed the less obnoxious and was fairly well filled with snow at its back although water gushed forth at several places. At first we could kick our way upward, but as soon as we entered between the gully's smooth enclosing walls I had to begin cutting steps in hard ice. Every now and then small rocks came sailing down. Dodging them was out of the question, but I managed to deflect one with the head of my axe. Another struck my thigh. They were not large enough or travelling fast enough to do damage. Our chief discomfort was the thought that at any moment a larger one might be released by the melting summit snows at the top of the cliff far above.

Finally, after ascending about 300 feet, we came even with a narrow sloping ledge running out onto the rib at our left, until now sheer and overhanging. The ice in the gully was here very thin over the rock, and I nicked the pick of my axe trying to make usable steps. A rivulet also emerged at this point, making things rather sloppy for several yards. Fred now took over the step-cutting while I eyed the dubious ledge. The steep ice up which Fred was slowly moving seemed to end in an impasse—20 feet of vertical and overhanging ice beneath a chockstone with only smooth rock walls on each side. The cliff itself had a projecting cornice running across its face at the level of the chockstone. I therefore sidled cautiously out on the ledge to the middle of the rib, where it terminated. It appeared, however, that one could ascend here; and, since the frozen waterfall toward which Fred was hacking his way looked worse than ever from this vantage point, I called to him to join me.

When he stood beside me, he agreed that the gully did not offer much prospect of success. I therefore stowed my pack on the ledge and gingerly hoisted myself the first few feet (no belay was available) until the rib began to round back somewhat. Fred then tossed me the coil of rope, and I proceeded to a large comfortable platform 30 feet above the ledge. From here I could belay him as he ascended encumbered with two packs and two axes.

From the platform it was impossible to get into either gully, except by a rappel; and in any case neither appeared at all climbable in this section. For that matter, our rib was obviously going to cause trouble, so I kindly offered to let Fred lead the next pitch. This consisted of a nearly vertical column, shattered, very exposed and not

MOUNT ERASMUS FROM COL ON ROUTE OF ASCENT
*Photo, J. C. Oberlin*



necessarily leading any place—at least not to any definite stance that we could see from below. As he slowly climbed up and around the corner to the left, he tossed numerous spurious handholds into space behind him, and soon I heard the clinking sound and muttered complaints which indicated that a piton was being put in. In due course the rope ran out again, and I was pleased to hear a happy shout signifying (I supposed) that he had arrived safely on a large shelf or setback. (When I later reached this same point I found only a small but flat stance, nearly large enough for both feet.) Again the sound of a piton being placed, more rope going out, and finally Fred announced that he was on a fine platform 60 feet above me where there was an excellent belay. He seemed skeptical that I could bring both packs and axes with me, but I assured him there would be nothing to it.

The first few feet were easy, but soon it became decidedly strenuous. After knocking out the first piton with a rock and clipping it to my waist loop, from which an axe already dangled, I soon reached the second piton. Here I was confronted with a new problem. The rope a short distance above me ran beneath a very loose block which gave every sign that it would drop on me when I stepped up on the delicate holds above my present stance. I solved that one by jerking the rope free and thereby dislodging the block, which then bounced off one shoulder and into the depths behind me. Surprised but undamaged, I pounded at the piton but could not get it out, so left it to be retrieved with the aid of the hammer on our return. The last 15 feet or so below the platform where Fred was perched, like impatience on a monument, were quite steep and exposed. My arms began to feel the effect of the pack straps, which tended to cut off the circulation as I reached up for holds.

The left-hand gully was still impracticable, but the right-hand gully offered its icy bed as a further route since we were now above the frozen chockstone waterfall. Fred hurried up it, utilizing holds in the rock wall at first; but he was soon forced to cut steps and finally to straddle from side to side, emerging on a slope of broken rock very insecurely stacked. After joining him I poked around into the left-hand gully and found it was only a pleasant scramble of 75 feet to the top of the cliff.

The main summit was to the south and appeared to be a snow dome, but it was such an easy walk between the edge of the snow

UPPER CLIFF OF MOUNT ERASMUS FROM CREST OF RIDGE TO SOUTH
*Photo, J. C. Oberlin*

BUSHWHACKING NEAR GLACIER LAKE
*Photo, F. D. Ayres*

and the edge of the cliff that we first visited the two lesser summits to the north, erecting a cairn on each. The view across the upper portion of the north face disclosed an ice cap and cornice crowning the cliff on this side; and, when we reached the main summit, we found that it was not a dome but merely a huge cornice crowning the eastern face. After erecting a third cairn here at the edge of the snow and leaving a record, we returned to the upper exit of our gully and at 5.00 P.M. started the descent.

We agreed that a rope would not be required for the icy section above the chockstone, and I believe we both later regretted this decision. Fred forgot that he had straddled the last few feet of ascent and had an uncomfortable time lowering himself to the uppermost ice steps, the slope of loose rock above the ice being most unstable. After allowing Fred an opportunity to get out of the line of fire, I profited from his example and started down in proper fashion. Once on the ice, however, I found the steps too far apart for convenience and despite some helpful instruction from Fred below developed a rather cold sweat before reaching the section where the rock wall afforded a few holds.

Placing a long sling around a big block on the upper platform, we quickly rappelled to the first platform. Fred retrieved, *en route,* the piton I had been unable to dislodge. Because it was impossible to protect the last man, we did not want to climb down to the ledge below and traverse back into the gully, nor did we relish the prospect of then descending more melting ice steps while subject to intermittent bombardment. This time, we searched long and diligently before a support for a sling could be engineered. The cracks were unsatisfactory for pitons; but finally we drove a piton into a horizontal crack on one side of the platform and, after threading a sling through it, brought the sling up over a horizontal slab and let it hang down on the side toward the right-hand gully. There was thus no outward pull on the piton, only a considerably reduced upward and slightly inward pull.

Using our 120-foot climbing rope and 140-foot rappel rope tied together, we descended two overhangs and arrived on a ledge on the far side of the gully below all the real difficulties. The ropes were coiled and a drink obtained at a little dribble, at the risk of a wallop from some pebbles which came bounding down; and then we

stamped our way down the snow cone to the foot of the cliff. The real climb was over, but it was a long way back to camp.

With the aid of the goat trail and little cairns we had set up, we managed to reach the col before dark; but the scree and heather slopes below seemed many times longer than in the morning, and we stumbled into camp ready to retire after only a most elementary supper.

The next day took us down to Glacier Lake, where we camped near the outlet. The descent of the wooded slope was most tedious but brightened by discovery of a clump of the lovely orchid, calypso. In a gully below the little cliff near the foot of the slope there are also a number of spectacular mountain lilies, somewhat resembling large orange tulips.

When it came to fording the Howse, I mistakenly argued Fred into attempting it downstream of our previous crossing; but happily it proved passable, and eventually we arrived at the highway and Warden Black's, somewhat dirty and footsore but not displeased with our little expedition.

# A Challenge on Mount Adamant

ANDREW JOHN KAUFFMAN, 2ND

FROM the mountaineer's point of view, the Granite Range of the Northern Selkirks probably represents the culminating point of the Interior Ranges. Its firm rock, soaring to almost 11,000 feet in a series of sharp spires, its multitude of cascading Nantillons-like glaciers, its extensive snow fields and concentration of peaks combine to form an alpinist's paradise. The country's inaccessibility and the intricate nature of the climbing have served to keep many summits unscaled. At this moment some of the finest peaks, such as Gibraltar, the Lower Blackfriar and the Gothic Spire, remain untouched.

Two years ago, Benjamin Ferris and Bill Putnam had visited the region with me and made several fine conquests. Ever since, we had longed to return. In 1950, unfortunately, both Bill and Ben were committed to European visits, and other companions joined me in the new undertaking. We were five: Betty Kauffman, David Michael, Dr. Alexander C. Fabergé and myself. After David, Betty and I had engaged in two rather strenuous training climbs at Moraine Lake, we drove to Golden, B.C., on 13 July 1950. There, in a local saloon, the remaining members of the party joined us.

With the faithful help of Bernie Garand and other members of a Canadian Government survey party camped on the Columbia 40 miles below Golden, we drove to Swan Creek, where we inflated our rubber boat for the struggle across the river. Bernie and his companions, whom we had met somewhat by chance, proved to be more than mere interested spectators. Their suggestions, hospitality and gratuitous muscular and mechanical aid served to boost the expedition's morale substantially. During the two-day fight which followed, against the worst mosquitoes the country had seen in 50 years and against tangles of slide alder, jackpine and devil's club, we often reminded ourselves of their keen interest and support. We finally set up housekeeping on July 15th at the 1948 campsite at Fairy Meadow. We found our "colossal" cairn and stone house still in good condition and our old food cache untouched by pilfering quadrupeds.

From Fairy Meadow the chief attraction (and there are many) is Mount Adamant. It is the highest peak of the range, rising to a point 10,950 feet above sea level. It is prominent and not far away, but the approach is intricate and somewhat roundabout. The mountain had been ascended only once before, in 1912, from the opposite (south) side, by a party consisting of Howard Palmer, E. W. D. Holway, Rudolph Aemmer and Edward Feuz, who considered the ascent difficult and perhaps dangerous. The peak had not been climbed from the north. Several attempts had been considered and suggested, but none had ever been made. From the outset, then, since we were in good physical condition and the weather was promising, we resolved to center our energies on Adamant. Little did we realize what lay in store for us.

There seemed to be three distinct ways whereby Adamant might be scaled from our camp, in addition to two more remote possibilities. Not one looked easy. Eventually, we came to grips with three of the proposed routes; and, since all five entered into our calculations, it may be appropriate to describe each in turn.

Mount Adamant is the central peak in a group of three: Pioneer Peak (with its satellite, the dagger-like Gothic Spire) lies to the east, while Turret and Austerity soar skyward to the west. On the north side, buttressing these peaks, are four steep hanging glaciers, separated one from another by sheer and apparently inaccessible rock ridges.

The first proposed route would involve the ascent of the "Holey Glacier" (so named not because of its piety, but because of its crevasses), which flows into the Granite Glacier from the northeast slopes of Adamant and the northwest flanks of Pioneer Peak. Much of the climbing would have to be done immediately beneath the Gothic Spire. Leaning séracs, steep slopes and huge schrunds and crevasses appeared to be the chief dangers and obstacles. If once we could reach a spur leading to Adamant's east ridge, the ascent, though roundabout, would probably not be excessively difficult.

Superficially, the second route appeared to offer equal problems with the first. Instead of attacking Adamant from the flank, this method involved a direct approach up the central hanging glacier, which descends to the Granite Glacier from between Adamant's east and west (higher) summits. Sterling Hendricks had proposed this route to us, and we consequently named the glacier after him.

It appeared to be a shorter route than the first, but more dangerous. Much of it was overhung by a huge ice cliff, from which avalanches descended chronically and beneath which the climbers would have to spend considerable time. Otherwise, except for the possibility of big crevasses and steep snow, this route did not seem especially difficult.

The third possibility was to reascend Austerity via the most westerly (Ironman) glacier, climb Turret (as Hendricks' party had done two years earlier) and go on to Adamant. The chief risk consisted in the length of the climb (there would be two peaks to climb back over in order to descend from the summit), and there was also a distinct possibility that Adamant's west wall, which separates it from Turret, could not be scaled.

A fourth opportunity was presented by the rather gentle (I use the word in a relative, not an absolute, sense) Turret Glacier, which flows from between Adamant and Austerity into the Granite Glacier. Unfortunately, the upper parts are exceedingly steep, with a fantastic wall of ice overhanging the northeast portion, and, apparently, extremely difficult rock cliffs for at least a thousand feet above. These cliffs would have to be climbed in order to rejoin the north ridge. Hendricks, who had considered this route in 1948, had termed it "probably impossible," although at the time Alec Fabergé, who accompanied him, had been somewhat partial to it.

A fifth possible route was also to be considered. It involved the ascent of Adamant's north ridge directly from its base. But this route also seemed to offer only remote chances for success, and it did not enter much into consideration at this time. Closer inspection subsequently led us to believe that, with suitable artificial aids, it would prove to be a fine rock climb.

On July 17th the entire party started out at daybreak under clear skies for Adamant, by way of the Holey Glacier. We made good time at first. Slightly over an hour and a half's march out of camp, we roped up on the upper Granite Glacier, which we proceeded to cross. An easy passage through a small icefall brought us to the base of avalanche debris, which had broken off from the ice wall immediately beneath the Gothic Spire. Above the avalanche-fan the slopes steepened sharply. We kicked steps up deep, wet powder snow until we reached the base of our first obstacle, a well-bridged bergschrund, with an awkward and vertical upper lip. While the

first rope, which I was leading, tried to cut steps over one of the easier portions of the schrund, the second rope, consisting of Alec and Norman, reconnoitered a hundred feet or so to the right (west) and found a still easier passage. We abandoned our efforts and followed close behind our luckier companions.

The passage selected by Norman and Alec had one disadvantage. Some 300 feet directly above it loomed two formidable séracs, perched at a dangerous angle. By now the sun had played for over an hour on these pinnacles, and small chunks broke off from them at intervals and avalanched past us. The sensation was uncomfortable. We hurried diagonally upwards out of the way as fast as the deep, wet snow would allow.

As we reached a point level with the top of the séracs, the angle of the slope eased. Hardly had we begun to relax before a new obstacle, more formidable than any yet encountered, rose ahead. A huge gaping bergschrund, fully 40 feet wide in places, stretched across our path. Although it was well bridged in places, its far sides rose vertically at least 50 or 60 feet. It appeared to extend, in the form of an ice cliff, all the way from the Gothic Spire across to the northeast ridge of Adamant.

In a somewhat futile effort to find a passage, the two ropes here separated. Stoutly belayed by David Michael and Betty, I climbed down some 15 or 20 feet into the crevasse and over a narrow bridge. With little enthusiasm I then began to hack with my ice-axe at the least uninviting part of the 50-foot wall beyond. Meanwhile, Alec and Norman moved to the right (west) along the sides of the crevasse, taking advantage of occasional bridges and cutting steps most of the way. At last Norman, who was leading, contoured to the far side of the schrund, to find himself on a 50-degree snow slope, which he now attempted to ascend. Betty, David and I, who had by this time abandoned our hopeless direct assault on the ice cliff, followed behind Norman and Alec, in expectation that they might have better luck than we.

This was not the case. Norman, who had reconnoitered some 30 or 40 feet out onto the slope, reported treacherous conditions. Beneath the snow—which had been softened by the sun—lay glare ice, and the entire area was in imminent danger of avalanching. Nor was there enough rope to reach a safe belaying point above the slope. One alternative only remained: to retreat.

We had learned one thing: Adamant could not be climbed this year from the northeast. We had made a good try, having reached an altitude of about 9600-9700 feet, with considerable effort and not a little risk. We dropped back to the base of the slopes, at about 9000 feet, where we picked a safe spot to lunch.

Somewhat refreshed, we made another abortive attempt that afternoon, on the near-by Gothic Spire. Again we struggled up steep snow slopes, this time under clouded skies and among snow flurries on the cold north walls of Pioneer Peak. Once more, with victory in our grasp, we were blocked by a big schrund. Weary and completely frustrated, we trudged back to camp. It had been a hard day, spent chiefly among some of the most fantastic ice and snow formations I had ever seen.

Next morning, the 18th, leaving Betty behind this time, we four renewed the attack, but from another direction. At first we planned to attempt the route up the Hendricks Glacier between Adamant's two summits, but another look at the threatening ice cliffs which overhung the area made us change our minds. Instead, we headed toward Austerity, hoping that perhaps, if time permitted, we might cross over Turret to Adamant.

Once again, although we reached the top of Austerity, we were stopped short of our ultimate goal. The ascent of the bergschrund and walls between Austerity and Ironman consumed much step-cutting effort and time over dangerous snow slopes. We reached the summit of Austerity at too late an hour and in weather too threatening to proceed further. We returned by way of Hendricks' exposed and fascinating 1948 route down over Ironman. We reached camp barely in time to avoid an evening electrical storm.

Still, the Austerity climb had been instructive. From its summit, as we looked longingly at Adamant, we had observed what appeared to be a feasible, if intricate, route up the Turret Glacier, thence over a schrund, up cliffs, and then zigzagging northward along somewhat diagonal gullies in Adamant's northwest walls to the north ridge, perhaps 500 feet below the top. Two years ago, Alec, standing on Austerity, had suggested this very route to Sterling Hendricks, but at that time the latter had rejected it—perhaps because different conditions then prevailed. When we first examined this approach, we reached much the same conclusion as had Hend-

ricks, yet a feeling of despair and frustration stimulated us at least to give it a try at the first opportunity.

After a day's rest in stormy weather, all five of us again set out at dawn on the 20th for Adamant. Despite extreme cold, high winds, fresh snow and billowing clouds, a sense of urgency drove us forward. This was to be Norman's and Betty's last day, for the former was due back in South Slocan on the 22nd, and Betty—who was not climbing as much as usual this year— had agreed to accompany him on the rather arduous and dangerous trip back to the highway.

We had hoped the weather might improve as we proceeded, but it seemed to do the opposite. The wind battered our parkas as we trudged slowly up the Turret Glacier. A breakable crust over deep powder—an abominable snow condition—cut our progress to a snail's pace. We wound our way around big crevasses and over narrow snow bridges. It took six hours to cover the 3500-odd feet of climbing between camp and the upper portions of the Turret Glacier at about 9500 feet.

Here, at last, it was necessary to cut into the shadows toward Adamant's northwest face, since the upper portions of the Turret Glacier, consisting mostly of a gigantic ice cliff, could not be scaled. Above us a poorly-bridged schrund blocked the passage to a steep snow slope which, in turn, led toward the first snow-cluttered rock chimney in Adamant's northwest wall. Our enthusiasm waned as we faced the problems ahead. The wind still howled, and snow dust whipped around us. Billowing clouds sailed across the summits of Adamant and Austerity, both of which were hidden in mist. There would be ice on the rocks, and we knew not what other troubles we might encounter. Alec considered further progress unwise, though Betty and Norman—for obvious reasons—still wished to push onward.

In order to satisfy everyone, and also to render the advance less cumbersome, we now decided to split the party. David graciously offered to accompany Alec to the Gothics Névé, some distance away, to see whether some of the lower peaks in that area might be in a less hostile mood. Meanwhile, Betty, Norman and I pressed our assault on Adamant.

With Norman in the lead, we moved cautiously and one by one over the treacherous schrund, thence up steep icy slopes to the

foot of the chimney. Here we drove a four-foot wooden stake into an ice crack for belaying and, ultimately, rappelling purposes. Norman next led around a chockstone and over icy rocks on the exposed face to the next stopping point.

We proceeded in this fashion for some time, until at last, about 80 feet above the foot of the chimney, we emerged on a large and steep snow patch, which divided a small portion of the face. Earlier observation of the area from the top of Austerity had taught us that we must climb to the head of this snow patch and then over dubious rocks in order to attain a long diagonal couloir leading northward to a point on the ridge.

Norman, who was still in the lead, kicked steps to the top of the snow, where he encountered difficulties. The rocks were covered with a veneer of ice, and his position was awkward. The belay spot, though good, was some distance below; the wind still howled; our fingers and toes were numb—and we decided, wisely we believe, to retreat. We made three rappels back to our starting point at the schrund. As we slogged back to camp, we speculated that it might be possible to overcome the icy northwest wall of Adamant with crampons (which we had not taken that morning) and a larger supply of ironware.

In contrast to the previous day, the 21st dawned perfect. Betty and Norman unfortunately now had to leave the region, departing at daybreak to reach the highway that evening. David and Alec were still weary, having wandered over much of the Gothics Névé the previous afternoon, though they had climbed no summits. Alec rather insistently wished to remain in camp; but David, after I had made the suggestion, manifested keen interest in accompanying me on still another attack on Adamant. Fully equipped with crampons, rappel rope and hardware, we two set out at sunrise.

We made excellent time. A cold clear night had frozen our previous day's steps solidly. They formed a veritable staircase up which we marched to the foot of the rocks. Since I knew the way beyond this point, I assumed the lead when we reached the schrund; and, with surprising ease, we hastened one after another to the foot of the snow patch. We had covered in three hours what it had taken us more than six to scale the previous day.

At the snow patch we paused to tie on our crampons, which we used with much satisfaction and effect from here until we reached

the north ridge. Still, despite this additional aid, I understood why Norman had stopped among the rocks immediately above the snow. A rather delicate pitch, somewhat extended, over icy rocks, lay immediately ahead. The place was steep and exposed. Even with a fine belay—some distance below—from David, I felt none too secure. I had to struggle upwards uncertainly for 40 to 50 feet over ice-coated rocks, until I found a place to drive a piton. Finally, I managed to pound one in solidly just below a few last crucial feet of tenuous balance climbing which led to the less treacherous gully.

From here the work became easier. We continued to move cautiously, one at a time, diagonally upwards and northwards, over icy rocks and crusted patches of snow. After more than two hours we finally emerged in the sunlight on the north ridge, just beneath the point where it is slightly intersected by the top of the great ice cliff overhanging the Hendricks Glacier.

Beyond this spot a rock cliff still blocked the way. Viewed face on, from where we stood, it first looked impossible. Closer inspection revealed a welcome chimney, which turned out to be little more than a hard scramble, in the course of which we drove another piton for safety. Above the chimney, it merely became a question of following steep but easy slopes, sometimes on rock, more frequently on snow, being cautious on the icy spots and probing for well-hidden crevasses. We now alternated the lead frequently and made rapid progress. At one o'clock, after a seven-hour climb, we stood on Adamant's summit.

We spent a full hour on top, basking in the sun and searching vainly for Palmer's records in a rock ruin which might once have been a cairn. It was perfect weather, without a cloud or breath of air in the sky, cool and sparkling, one of those unusual crystal-clear days when even the farthest mountain stands sharply against the horizon. The stillness was broken only by the distant murmur of torrents and the rare muffled roar of an avalanche. Mount Robson glistened splendidly in the north; and, far to the south, we could even discern the familiar outline of Mount Butters in the Battle Range, where I had been three years before. Beneath our feet loomed the somber Blackfriars, and, behind them, Mount Sir Sandford. Our one regret, as we contemplated the scene, was that Norman Brewster, who had worked so hard to pioneer the route

and been so keen to reach the summit, could not share our success.

We returned to camp as we had come, rappelling five times on the way over the difficult places. When we reached Fairy Meadow at suppertime, Alec hastened towards us, full of inquiry, and offering welcome fruit juice. For a time we sat, weary but triumphant, on the heather. It was a day we should never forget.

It had taken more than ordinary perseverance to find a route up the north side of Adamant. In our efforts we had learned one thing: that Adamant can probably be climbed from the north by more than one method, but that surely there is no easy way. As for ourselves, we had the unusual satisfaction of having at last overcome an obstacle which on more than one occasion had seemed insuperable. The route we had finally selected was intricate, extremely hard to find—it winds around the Turret Glacier and all over the northwest face of the mountain—and at times difficult, both from the rock climber's and from the snow technician's points of view. In fact (and this is perhaps the chief cause for our sense of achievement), we had more than once, even on the final route, been uncertain of success. But from the mountaineering standpoint we had found a way which is reliable and safe. This is more than we can say for any other route we attempted or contemplated.

The ascents of Adamant and Austerity, and the abortive attempt on the Gothic Spire, by no means completed our sojourn in the Northern Selkirks. In the following days we made first ascents of easy Mount Sir William (*ca.* 10,000 ft., north of Mounts Colossal and Yellow) and deceptive Mount Edfalls (*ca.* 10,500 ft.)—where we mistook a difficult false summit for the real one, which turned out to be simple. Later, in the Gothics Névé area, we made first ascents of Mount Sir Benjamin (*ca.* 9,700 ft., east of Gibraltar and Fria) and of the Gargoyle (10,250 ft., the extreme easterly peak of the Gothics, even east of what is known as the East Peak, which we climbed two years ago). Finally, at the end of our journey, we bivouacked at our old campsite on Azimuth Mountain, whence we climbed Mount Belvedere. We had hoped to attempt the lower Blackfriar as a finale to our pilgrimage, but time and the weather would not permit it. On July 27th we returned to Fairy Meadow where, a few days earlier and much to our delight, Gerry Cunningham's party had met us. Bidding them now goodbye, we trudged back down among the mosquitoes and devil's club to the highway.

# The North Wall of the Grand

Ray Garner

IN the 50-odd years it has taken for the Grand Teton to progress from an impossibility to "an easy day for a lady," many memorable ascents have been made. The peak that was once considered unclimbable has now been surmounted by eight distinct routes—and several variations.

The first ascent, which must certainly be recognized as one of the great feats of mountaineering in this country, was made by the Owen party in 1898. Then followed a lull of 25 years; the Grand was not climbed again until 1923. In 1929 Henderson and Underhill succeeded in putting a route up the East Ridge. The big year was 1931: Underhill and Fryxell pioneered the North Ridge (referred to at that time as the North Face); Underhill, Phil Smith and Truslow did the Southeast Ridge; and Glenn Exum made his epic solo climb of the Southwest Ridge. No new ascents were recorded thereafter until 1936. This year saw the first party on the North Wall. Paul and Eldon Petzoldt, and Jack Durrance, put a route up this precipice that followed the true North Wall for a little over three-quarters of its height. At the upper snow ledge it joined the North Ridge. (This climb was repeated in 1941 by a party of four on two ropes: Paul and Bernice Petzoldt, Glenn Exum and Hans Kraus. Bernice Petzoldt is the only woman who has ever been on the North Wall.) In 1937 Paul Petzoldt, Smith and House did the Southeast Face. When Jack Durrance and Coulter climbed the West Face in 1940, the mountain's last defences had fallen.

Some of the variations which have been made (and others yet to be done) offer plenty of first-rate climbing, but the aforementioned eight routes cover the only major faces and ridges of the mountain. On my return to the Teton in 1946 I began a study of the North Wall to determine whether the remaining (and, as it seems, overhanging) portion could be climbed. That summer Jim and Kirk Smith and I made an attempt. We had great difficulty passing the overhanging ice cornice above the bergschrund of the glacier. It took us three hours to reach the rock wall. Our plan was to try and push a completely new route. We purposely avoided both of the large snow

ledges—and got hung up on the east side of the wall fairly close to the East Ridge. We rappelled down to the glacier. Our failure had consumed 18 hours and given us great respect for the mountain. It had also convinced me that the only practicable route would include both of the large snow-covered ledges.

It was not until the summer of 1949 that I had the opportunity to join another attempt. Dick Pownall and Art Gilkey had been looking it over for three years, too. They were both guiding professionally with the Exum-Petzoldt School at Jenny Lake. We planned to make our try as soon as they had free time. The unexpected arrival of Mike Brewer, one of Glenn Exum's former guides, made it possible for both of them to be away at the same time.

On the night of August 12th, Dick, Art and I put our camp in the center of the lower portion of the Teton Glacier. Both Dick and Art had climbed the mountain that day. Dick had made the North Ridge (and descended by the East Ridge!), while Art had taken a party up the Exum Route. We had intended to spend the next day in rest and reconnaissance, but another party of climbers who had not previously signified their intentions were also planning an attempt on the North Wall. We decided to make our try the next morning.

Long before dawn of the 13th we started up the glacier. The weather was perfect, but the condition of the glacier was far from being so. It has been receding year by year, and new cracks are opening all the time. In the dim light we had to move cautiously to find a safe track through the maze of gaping fissures. Two or three times we heard the ominous crunch which presignifies the cracking of a snow bridge—and we were quick to shift the scene. At the top of the glacier we stopped to eat breakfast. A half-hour later it was light enough to begin the climb. This time the bergschrund gave no trouble at all. We walked right up to the rock and found a convenient gap in the ice cornice. We were on the wall at 5.00 A.M., less than two hours after leaving our camp.

We left our ice-axes and crampons at the bergschrund. This equipment, and the tent and sleeping bags from our camp below, were to be taken down by Marshall Hurwitz and Dennis Denitch, who had spent the night at Amphitheatre Lake.

The first pitch led straight up to, and through, the gap in the ice cornice—a vertical distance of 40 feet. Dick and Art joined me here. Art, anchored by Dick, belayed me as I made an 80-foot traverse

to the left across the snow on top of the cornice. Here the snow and ice swept sharply up, and I climbed 60 vertical feet with ice on the left and firm rock on the right. All three of us gathered on a large ledge. Here we placed the first piton, and here we made our only *courte échelle*. With Art working the belay, I stepped on Dick's rock-like back, shoulders and arms until I was easily able to pull up to a comfortable ledge. I took up a stance 30 feet above Art and brought him up to me. On a 45-degree diagonal to the right, I went another 70 feet. From the beginning the climb had been on firm rock, but moisture and loose dirt had made the footing insecure. Art and Dick joined me, and we switched the lead.

Art led diagonally, to the left, along a slab for 80 feet. We were carrying food, cameras, bivouac sheets and extra climbing iron in two packs. These were naturally carried by the second and third men on the rope. As I was slipping into the harness of the pack Art had left, I hooked my wrist watch on the straps and tore it loose. I watched in dismay as it slid off the ledge and down the cliff face. It missed Dick's head by inches. Had he been looking up at the time, he could easily have caught it. This was the first of a series of losses which made our ascent an extremely expensive undertaking.

When we joined him, Art led up another 80 feet—slightly diagonally to the right and then straight up a broken face. From this point he led a 60-foot traverse to the left, and brought Dick up. We had switched positions again, so that I was now last on the rope. I found this the best position for making notes—the leader is continually climbing or belaying, and the second man is feeding the leader's rope or belaying the third. Only the end man has the opportunity to touch pencil to paper—or just plain sit.

Art and Dick were now in a chimney which was completely chocked by a rock as big as a house. Here Art made the best technical lead of the climb so far. He worked out on the right side of the chimney onto the face. From here he went straight up over an overhang (and we were already high enough above the glacier to make this sort of thing very interesting) to a point where he could cross the top of the chockstone to the left side of the chimney and then climb straight up to a broad ledge—a total distance of 70 feet.

Following Art's lead on this pitch was a tricky proposition. The rope was now pulling over toward the left wall, and Dick had to climb the overhang on the right. When he reached Art, he was able

to swing the rope over so that I could climb out to the left of the chimney and go up the wall with perfect protection.

Art's next lead was a full 120 feet up an easy broken chimney. Then followed a long traverse to the right in the course of which we gained only 20 vertical feet. All three of us walked up a sloping ledge for the next 60 feet.

We could now see the beginning of the first large snow ledge, seemingly only 200 feet above us. I led 100 feet up a chimney which was full of loose rock. It was impossible to move here without dislodging some of it. Yelling to Art and Dick to take cover, I pulled out and threw down some of the larger and more offensive pieces of rock. One of these caromed off a ledge and headed toward Art and Dick. It missed them, but it struck the rope where it lay on the ledge, parting some of the nylon strands. This was a serious blow to us: we had only two ropes along, and now one of them was rendered unsafe. We knotted it so that I could belay Dick up.

The next lead was an easy 90-foot face climb. When Dick again joined me, I climbed another 90 feet of face and then entered a chimney. From here on the going became a little tougher. The chimney was at first too broad to use opposing side pressures. I climbed the right wall on very small dirt-filled cracks. At one point I had to retreat four times. It was one of those problems of balance and pressure which take a little study to solve. The angle of the rock was less than 70 degrees, and the left wall of the chimney gave psychological security, although I could not reach it. Dick was just about to take over when I made it. A firm splinter of rock two feet to the left gave just the amount of side pressure necessary to achieve balance on the tiny footholds. A few feet above this point Dick joined me, and I continued on up the chimney. On a single narrow ledge I found no less than five pitons hammered into a crack. These were coated with rust and were all of the homemade strap iron variety which Petzoldt sometimes uses—probably relics of the 1936 ascent. Conditions in this chimney must have been very different 13 years ago. Possibly it was running with water at that time. Since the rock was quite dry when we passed, we used no pitons at all. As I went higher, the left wall of the chimney closed in. Now it was possible to use continuous pressure with my back on the left wall and my hands and feet on the right. This chimney measured 160 feet, and it ended just at the lower portion of the large snow ledge. In a crack

deep in the corner I found a piton and karabiner in place. The karabiner was well rusted, but the hinge was still serviceable. This has been presented to the Museum at Jenny Lake.

As I scrambled out onto the broad platform of the large snow ledge, I could see two very desirable things—warm sunlight and running water—both no more than 50 feet away, but both quite out of my reach for the moment. It was now past 8.00 A.M. We had been on the wall for more than three hours. Our last drink had been just above the glacier. Since starting the climb we had been in heavy shade. My throat was so dry that it ached, and my body longed for the warmth of the sun, but I could reach neither water nor warmth until Dick and Art joined me on the ledge. This took time because both were carrying packs, and Art was still 100 feet below Dick's position. When all three of us were finally assembled, we walked rapidly up the 45-degree slope of the ledge to a spot where both sunlight and water were abundant. Here we ate a hearty lunch.

Glenn Exum had mentioned that we would find some very interesting climbing on the exposed cliffs between the two large snow ledges. This was what we had been saving Dick for. He was in the pink of condition from a summer of guiding; and, despite little rest and the extremely difficult climbs he had led on the days preceding this attempt, he still seemed not in the least tired. Dick led the way, kicking steps, up two 100-foot snow slopes. Then he climbed 40 feet up a rock wall. A 100-foot traverse to the right brought us to the base of the cliff separating the ledges. Using two pitons for protection, Dick did a very fine lead of 30 feet up a shallow chimney in the exposed face. The drop was practically vertical all the way down to the glacier, a distance of some 1400 feet.

Another 30 feet of exposed face brought Dick to a broad ledge where he was able to belay us up. From here the angle of the face eased off the vertical, and Dick led up another shallow chimney, using another piton for protection. Here he was faced with a six-foot overhanging wall. He brought Art up to his position; and, after trying to find a way to either side, he decided to go right up over the overhang. This was a little tricky because of the lack of handholds; but Dick was hotter than a firecracker by this time, and he easily wormed his way up. A minute later he stood safely on the upper snow ledge. The vertical distance between the two large snow ledges was exactly 120 feet.

This upper ledge had the same lateral slope as the lower—about 45 degrees. It should have been an easy walk, but it was covered with a slime compounded of lichen and water from the melting snow. This held us up for a good hour. A tongue of snow hung down to the point where the ledge joined the wall. We tried to cut steps with our piton hammers, but it was much too hard. We saw that the only way would be out to the edge of the ledge, where the rock was reasonably dry. We rigged a double belay using both ropes. Dick held one rope on about a level with Art, and I climbed as high as I could on the snow to decrease the arc of Art's swing if a fall did occur. Art made an extremely delicate traverse out over the slimy rock. Our double belay would prevent a long fall, but we could not have helped his smashing into the wall if he had slipped. Near the outer edge of the ledge he found firm footing and was easily able to scramble up to a secure anchor position. He held the rope firmly while Dick and I went up hand over hand. From here on, the ledge was a simple walk. We went up, diagonally, about 200 feet more.

It was now 4.00 P.M. If we continued on this ledge, we would soon come to the North Ridge and could be on the summit in an hour. This was the way the Petzoldt-Durrance party had finished their climb in 1936. Above us, the unclimbed upper section of the North Wall rose vertically for several hundred feet before it broke away toward the summit. Our objective was to climb this remaining section of the wall—but only if it could be done without direct aid.

There were two chimneys leading upward, but Dick chose a broken face for his next lead. He went straight up about 50 feet, and was then easily able to reach the third diagonal ledge. This parallels the second (or upper) large snow ledge, and also runs all the way out to the North Ridge. When all three of us reached this point, we walked diagonally up to the right for another 100 feet. The wall above us was now overhanging. We searched for a crack or chimney which might reduce the angle to the vertical. Dick again took the lead. He went up a shallow chimney and then swung out to the left onto the face. Some 50 feet above us he reached a narrow ledge just below an impossible overhang. Using three pitons as an anchor, he belayed Art up to him. The ledge they were now crouched on extended 15 feet to the left, but there ended abruptly at the corner of another chimney. Belayed by Art, Dick made several attempts to traverse out around this ledge. He gave a wonderful demonstration

of delicate balance climbing, but was not able to turn the corner safely. It looked as if we were stopped for sure. If we could not get into the chimney which now lay only a short distance to our left, we would be forced to go out onto the North Ridge. But Dick was not in the mood to be stopped. He called for the extra climbing rope. Then, with a fixed rope in position, and with Art working the belay on the other rope, he slid down the face and gradually worked his way to the left. He was safely belayed, and he had a fixed rope to hold on to, but both of these actually hindered his progress to the left. When the drag became too great to continue, he hammered in a piton and so eliminated the side pull. Sliding down a few feet lower than the piton, he finally was able to worm his way over into the neighboring chimney. This was not only fine climbing, but sharp headwork under difficult conditions, for which Dick should be congratulated.

Dick then climbed up his chimney until he was opposite Art and some 30 feet to his left. Art pulled one of the ropes back from Dick's position and threw it down to me. We hoisted both packs up, and Art tied them to a piton. Then he belayed me as I climbed up to his ledge. Here we had to cope with as beautiful a mess of rope spaghetti as could be imagined. The first thing Art did was to anchor me to a piton, and then we studied the situation. There were some 200 feet of nylon in a hopeless tangle—plus Art, me and two packs—on that narrow ledge. With hardly enough room to move our arms, we finally untangled the rope and were able to tie the packs on the section of rope which ran around toward Dick. With Dick pulling and Art feeding rope, both packs were safely slid out around the ledge and into Dick's chimney. Then Art followed, belayed fore and aft. Dick maintained his belay position, and Art moved up the chimney to give me protection from above. With this double belay the trip along the ledge and out around the corner was a simple maneuver.

A short scramble brought us onto the fourth and final ledge. This was at a slightly steeper angle than the second and third ledges, and it was much shorter in length, but it too ran out to the North Ridge. We walked up along it for about 100 feet.

It seemed unbelievable, but Dick was still not showing the least bit of fatigue. He had made very difficult climbs on the three previous days, and had had only two hours sleep the night before, yet

he seemed to be at the peak of strength and endurance. Dick again took the lead. He went up a shallow chimney a distance of 80 feet until he was again stopped by a huge chockstone. The exposure was terrific, and the upper section of the chimney was coated with ice. He placed two pitons as anchor points and then belayed me up to his position. I could not imagine what he had in mind for his next move. There was no possible chance of continuing upwards, and the face on both sides of the chimney was hopelessly overhung. As I drew close to Dick, I could really appreciate the type of leading he had been doing. The final eight feet below his ledge stopped me cold. It was slightly overhung, and what holds there were—hardly any at all—were ice-coated. I did have a pack on, but this burden did not affect my eyesight. I just could not figure out how he did it. It was deep twilight by now, and time had become very valuable. I called for a fixed rope and went up to Dick hand over hand. There was not room enough for us both on his ledge. While he balanced on a single foothold, I crouched into belay position on the tiny ledge. I could get my seat and both heels on the ledge. With two pitons as anchors I worked the belay across my thighs. Dick climbed straight down for 20 feet and then started a traverse to the right. He travelled laterally another 20 and then entered a neighboring chimney. Forty feet straight up this chimney, and we heard him yell in triumph. He stood at the very top of the North Wall!

We still had our problems. Dick could not give me an adequate belay from the top of his chimney. I had to climb back down with practically no protection. Then I called for a fixed rope so that I could swing across to Dick's chimney. He called a warning about a loose slab halfway across. I could dimly make it out in the gathering dusk. It was a huge splinter of rock standing on a ledge and leaning in against the face. In order to avoid it, I climbed down a few more feet and took the giant swing. This particular rope was only three-eighths of an inch in diameter. It was quite a thrill to swing out on that thin strand of nylon and look down thousands of feet to the glacier. The rope had more stretch than I figured on, so I struck the face several feet below the aiming point. This final chimney proved to be quite a climb. Again I was amazed at Dick's ability under adverse conditions. This chimney would have been a nice test of skill on a Sunday afternoon practice climb. Dick did it, with seem-

ing ease, after 18 hours on the wall. By the time I joined him on the top ledge, it was thoroughly dark.

Art was still 90 feet below us, and the rope led straight up over an overhang. We lowered the other rope to give him a fixed rope as well as a belay. Our plan was to try and pull him up as he helped himself on the fixed rope. We had taken in about 30 feet when we heard Art call to be lowered again. Because of the friction on the pull rope, we were able to give him only a very little help, and the overhang swung him out of contact with the cliff. Thus, he was trying to pull himself, plus the pack, up on the strength of his arms alone. When Art got back down to his ledge, he tied the pack to the fixed rope, and we hoisted it to the top.

We set Art's pack down carefully next to mine. A few seconds later we changed our positions, and Dick's rope fouled the pack. We saw what was happening, but could do nothing to stop it. The pack rolled off the edge and disappeared into the depths below. The next sound to break the silence was Art's questioning voice. He heard the pack whizz past him, and it certainly did not sound like a falling rock. He thought it was me! When I asked him why he thought it was me and not Dick, he replied that it made a soft thudding sound as it rolled over the edge, and Dick would have made a clank.

We mourned our loss for some moments. The pack contained both cameras—two Retinas valued at about $80 each, belonging to Art and Dick. As these were the only cameras we had with us, all the pictures we had taken on the climb were lost. The pack also contained Dick's Bramanis, bivouac sheet, clothing and some food.

After we stopped cussing, Art started up. He climbed the chimney on the left, as we had done, and then took the swing out around the splinter and into the final chimney. When he joined us we started the walk toward the summit.

At 10.00 P.M. we signed the summit register. This was done by match light. Then we sat around for half an hour, waiting for the moon to rise. During this interval Dick proved that he was human by falling fast asleep. The moon was, of course, on the wrong side of the mountain to light our descent by the Owen Route, but from reflected light we had sufficient visibility for a safe descent. Since I was not nearly in so good condition as Art or Dick, Art went on ahead to prepare the camp on the saddle while Dick went down

slowly with me. Several times we both felt ourselves nodding as we sat down to rest. We reached the lower saddle camp at midnight. Art had everything in readiness. We crawled into the sleeping bags and were soon unconscious. The next morning we leisurely packed the saddle camping equipment and hiked down to Jenny Lake. On the trail we gave a message to some ascending hikers to tell Marsh and Denny, at Amphitheatre Lake, that we were safely off the mountain.

Two days later the indefatigable Dick, with Mike Brewer, spent 19 hours scouring the glacier area for the lost pack. They climbed all the way to the top of the shoulder of the North Ridge and then a few hundred feet down on the Valhalla Canyon side. Here they were caught in a heavy snow flurry. Since Mike was wearing shorts, this proved to be quite an experience. On the descent Dick searched the area where the shoulder joins the North Wall, while Mike paralleled him 200 feet to the north. About 200 feet under the top of the shoulder, Dick spied a blue cheese wrapper. Several feet farther down he found more evidence in the form of bits of paper, food and foodbags. This continued for several hundred feet until the couloir became too steep for safety. Dick and Mike figured that if it had gone this far it had probably gone all the way to the bergschrund of the glacier far below. They retraced their route to the glacier, climbed across the bergschrund, and then some 400 feet up the couloir formed by the Wall and the shoulder of the North Ridge. Here they found the remains of the pack—only 50 feet below the point where they had abandoned the search from above! Dick's Bramanis were in perfect condition. He put them on before taking inventory of the cameras. Both had been in the outer pocket of the pack and were pretty well banged up, but the lenses were still intact. We mailed the remains to Eastman in the hope that something of value might be salvaged, and that there might be a usable picture on the film still jammed in the cameras.

# East Face of Thor Peak

Richard Pownall

FEW of the many mountaineers who frequent the Teton Range know or have heard of Thor Peak, a mountain rising to an elevation of 12,018 feet, located at the head of Leigh Canyon and partially hidden by the massive southeast shoulders of Mount Moran (12,594 ft). Were this peak more accessible, it would be one of the major climbs in the range. Because of its remoteness, it has escaped the notice of mountaineers.

During the summer of 1949, Mike Brewer and I, while we were guiding[1] on Mount Moran, noticed this handsome peak with an alluring east wall rising very sheer from a small glacier. We were immediately aware that we had found an unnoticed face which looked to be a very challenging climb. On checking the mountaineering files at the headquarters of Grand Teton National Park, we found no official record of an ascent on Thor Peak, though we were certain that the peak had been climbed. We were fairly certain, however, that the massive east wall had not been ascended. Here, we believed, was one of the last major first ascents remaining in this region.

It was not until 18 July 1950 that Mike and I were able to make an attempt on the face. We set out from Mountaineering Headquarters at Jenny Lake at 6.00 A.M., crossed Leigh Lake in Mike's fold-boat, and started bushwhacking up Leigh Canyon. We were travelling lightly, with a minimum of food and climbing gear. Even so, we did not conquer the approaches to the face until noon, which found us perched on a ridge directly opposite the face and some 200 feet above the glacier at the foot of the face. We decided it would be very foolish to attempt the face at such a late hour. We spent a couple of hours on the ridge photographing the wall and sunbathing. From this position we found the precipice to be even larger and more tempting than we had previously supposed. What we had considered to be a 500- to 700-foot face turned out to be a 1200- to 1500-foot rock wall. The top third appeared to be vertical.

[1] Mike Brewer, of Yale University, and Dick Pownall, of Iowa State College, were employed as climbing guides in the Exum-Petzoldt School of American Mountaineering, Grand Teton National Park.

Our observation convinced us that we had found a climb that would equal any in the range in technical difficulty. We decided that to do this ascent safely would require at least a three-man party. Glenn Exum was our obvious first choice to complete the personnel of our party. Glenn has been guiding in the Tetons since 1929 and is active partner, with Paul Petzoldt, of the guiding concession at Grand Teton National Park (Petzoldt-Exum School of American Mountaineering). Glenn's ability and experience as a mountaineer would definitely strengthen our party. Also, the three of us had never climbed on the same rope and were eager for an opportunity to do so. Glenn was more than ready to join us in our attempt, and we decided that we would make the try at the first possible opportunity.

July 22nd was the day set for our attempt. Late in the afternoon of the 21st we gathered our provisions and climbing equipment and set off via fold-boat across Leigh Lake to base camp.[2] We had previously anticipated setting our base camp in a pleasant meadow we had located halfway up Leigh Canyon; but, owing to the lateness of our departure from Jenny Lake (7.30 P.M.), we were able to go no farther than the head of Leigh Canyon before dark. Making camp next to Leigh Creek turned out to be a mistake: our bivouac was a nocturnal rendezvous for porcupines. The first assault was discovered by Glenn at midnight. He was rudely awakened by a porky at the head of his sleeping bag. Mike and I were immediately awakened by Glenn's bloodcurdling alarm and rose to the occasion armed with rocks, clubs and other primitive implements of the chase. The noisy stream provided excellent cover for the rustling approach of the enemy. We failed to notice several subsequent approaches of the marauders until they were within a foot or two of our sleeping bags. Some half-dozen attacks prevented us from getting more than an hour's sleep that night. Several quills were discovered in Glenn's boots, which he had been using for a pillow.

Breakfast completed and camp cached, we started our trudge up Leigh Canyon at 5.30 A.M. After an hour and a half of bushwhack-

[2] Equipment: two cameras and ample film; three sleeping bags; primus stove, food supply, cooking and eating utensils; one bivouac sheet, sneakers, packs, parkas; two 120-ft. lengths of 7/16-inch nylon climbing ropes, two piton hammers, several karabiners, and a good variety of pitons. Mosquito repellent proved to be an essential item. We towed all this equipment across Leigh Lake in a one-man rubber life raft. All three of us rode in Mike's two-passenger fold-boat.

ing, we reached the foot of the long moraine leading to the small glacier at the foot of the east wall of Thor. Here we took a break, cached our packs, left food for our return, changed to sneakers and, after eating and resting, started ascending the long talus slope.

By 9.10 A.M. we were on the glacier. Here we met our first difficulty: the snow leading up to the face was very hard and much steeper than we had suspected. Glenn and Mike had smooth-soled tennis shoes and were not able to move at all safely on the slope leading to the face. I was wearing cup-soled basketball shoes and was able to move a little more easily. With a piton in each hand I was able to scramble some 300 feet to the bergschrund. Three times I fixed the rope for Mike and Glenn to come up on, hand over hand. Then, while we were on the lip of the bergschrund, wondering where to start up the face, we were given a scare as the section of ice on which we were standing broke loose and fell some six or eight feet before jamming itself. As no damage was done, we hastily left the ice and started directly up the wall.

I took the first lead, ascending 120 feet up fairly smooth friction slabs to a broad ledge which offered a natural anchor position for belaying. Mike was next up, and Glenn followed immediately after. We were now off the snow, but discovered a new danger: the face showed evidence of many rock falls. There were many fresh white scars on the slabs. We chose the most vertical rock and tried to locate anchor positions which offered overhang protection.

Our order on the rope remained the same as I took out 120 feet of rope. This lead was over friction slabs of the same type. A 20-foot overhanging chimney led to the next protected anchor position. The rock was good but offered no cracks for pitons. The chimney was relatively difficult to lead.

Mike took the next lead up a series of two broken chimneys and slabs to a grassy ledge. Here we found water and were well protected from falling rock. We unroped and spent some 15 minutes eating our lunch and plotting our course.

We again changed leads. Glenn took the next 480 feet with Mike second. The first lead was up a fairly easy 100-foot chimney which began at the lower edge of a snow patch. The next pitch covered a series of blocky ledges climaxed by a 50-foot chimney which was well lubricated by running water. Glenn ascended another 120 feet of friction slabs, traversing toward the right slightly. Glenn's last lead

included a series of vertical faces (seven to ten feet high) and ledges with a slight leftward traverse which brought us to a broad ridge.

Mike now took over the lead with Glenn second. I remained at the end of the rope as recording secretary and chief photographer. The next 120 feet were easy going. We all moved together. We could now see the V-chimney in the middle of the face which we had sighted from below as a possible route up the vertical portion of the face. The next series of leads required an upward traverse to the left toward the bottom of the V-chimney.

Mike's first lead was up a series of broken, ledgy faces and included a difficult 40-foot vertical friction chimney. Again no pitons could be used. Mike next made a very good lead by ascending a 50-foot chimney, then an upward traverse to the right for 30 feet. He climaxed the lead by ascending a vertical 30-foot chimney before anchoring. The next lead took us up a 15-foot chimney, traversed to the left for some 20 feet, and then went up a ten-foot wall to a beautiful flower-covered grass ledge. Mike then led an upward traverse for 150 feet to the left. This brought us to the base of the V-chimney.

Mike started the ascent of the V-chimney with a full 120-foot lead which brought him to a precarious position—absolutely no place to anchor. He wanted to go higher. To make Mike's upward progress possible, Glenn made a free climb, without protection by belay, of 60 feet and then anchored. Mike then ascended very difficult rock for some eight feet. Here he stopped for a short time to try to insert a piton. Finding no cracks, he started a traverse on the right wall of the chimney. It almost proved disastrous. With one good foothold and handhold, Mike attempted a long step across a smooth portion of the wall to another foothold. As he started to shift his weight to this foothold, it crumbled out and left him pivoting on a left hand- and foothold. He quickly recovered himself and started descending to Glenn, who was well anchored nearly 100 feet below.

I was then belayed up to the anchor position, and we held a short council of war. It was decided that I would take over the lead for the remainder of the climb, and that Glenn would stay in the middle as my belayer. Dark clouds were starting to gather, and distant thunder could be heard. We knew we should get up the face—but quick!

The V-chimney looked bad, but I wanted to give it a try before turning back from this position. I could see that the upper two-thirds

of the chimney appeared easier than the bottom. With a good belay from below, I started up. Reaching approximately Mike's highest point in the chimney, I found the climbing to be very, very poor. There were no piton cracks, and furthermore the rock was rotten and down-sloping, making hand- and footholds very precarious, if not impossible. It took me only a moment to see that it would be foolhardy to climb any higher on this type of rock. I quickly descended this stretch of the chimney and joined Mike and Glenn for another powwow.

Before we traversed to the bottom of the V-chimney we had noticed an alternate route, a second chimney, steeper but climbable, some 60 feet to the right of the V-chimney. With the weather still more threatening, we made a quick 100-foot descent out of the V-chimney, and I started up our alternate route.

My first lead was up a fairly vertical 80-foot chimney. Here I was momentarily stopped. The rock in the upper portion of the chimney sloped downward, in contrast to the in-sloping rock of the bottom portion. I drove a piton, the first one we were able to get into the face, and made a slow, touchy traverse to the right on a vertical wall which brought me to some good rock that offered a route upward. I ascended another ten feet to a good anchor ledge and belayed Glenn.

My next lead was up a vertical chimney for some 60 feet. I anchored at a good chockstone while Glenn belayed Mike up to the last ledge, and then Glenn came up to my position. We were now some 200 vertical feet from the top of the face. Our hopes of success were high. The rock above us appeared to be solid and to slope favorably, although it was very steep. The weather was still growing bad, and we knew we must hurry.

The next lead I took was a full 120 feet directly above Glenn. He could watch me all the way. The rock proved to be very fickle. The top 40 feet turned out to be down-sloping and loose, with slight outward-bulging sections that were very annoying. At the end of the lead I was able to get in a good vertical piton on which to anchor. I was perched directly under a yellow band of overhanging rock.

Glenn belayed Mike to the chockstone and then ascended to my position. I remained anchored, took Mike's rope, and belayed Glenn as he attempted the overhang. The first 30 feet of Glenn's lead proved to be the toughest climbing on the face. He made a direct

ascent of several overhangs in the form of outward bulges. To make the climbing even worse, the rock was still down-sloping and loose. I was well anchored and on the alert to catch Glenn should some of the rock give way under him. None did, and it was only a matter of minutes before he had 120 feet of rope out and yelled down that he was on the summit ridge.

Mike quickly scrambled up to me and anchored on my piton as Glenn brought me up to the ridge. Glenn belayed Mike up as I caught up on my note-making. The weather was clearing, the time was 4.00 P.M., we had made the face. . . .

After 300 to 400 feet of scrambling up the summit ridge we were on the summit. Time, 4.30—twelve hours from base camp, ten and a half hours from our packs, seven hours of tough face climbing.

We found on the summit a small cairn which disclosed evidence of a previous ascent. Inside the cairn was a tobacco can containing a note left by Paul Petzoldt. Paul had made two ascents of the peak, the second in 1935. He had ascended by the easy slopes on the southeast. We salvaged his record and replaced it with a fresh one describing his ascents and our climb of the east face.

A speedy descent down the southeast side brought us to our packs. We changed to boots and quickly devoured our remaining chocolate bars, a can of corn, apricots and tomato juice. Within an hour we were back at our base camp. We packed up and started across the lake just at sunset.

I would rank this ascent, as a face climb, close to the finest in the range. The best face climb in the range is without question the North Wall of the Grand Teton. The East Face of Thor is a shorter climb by about 600 feet; but there is just as much vertical climbing on it, if not more.

The climb was very enjoyable—which is not characteristic of first ascents. The exposure and loose rock in the upper portions of the wall made the climb interesting and made for a climactic culmination of the difficulties that had to be conquered. Glenn's last lead was one of the finest I have seen—the highlight of the climb.

This climb should definitely not be judged on the basis of the number of pitons used, etc., etc. We certainly would have used many more had cracks been available. The difficult pitches were absolutely void of suitable cracks. Also, it should be pointed out that all three

of us had been guiding actively all summer and were in top climbing condition—able to climb difficult rock to the top of our ability with sureness and safety.

We recommend this climb for experienced climbers who come into this area. Although it is remote and hard to get to, the climb is well worth the effort. It is a real treat to get into a canyon that few people have been in and to climb a peak the summit of which has been touched by only a very few people.

# An Ascent of the Watzmann Ostwand

Richard N. Meyer

THE Watzmann, an 8900-foot peak in the Bavarian Alps, dominates the ancient little town of Berchtesgaden as majestically as the Matterhorn does Zermatt. Many thousands of Americans admire it every year, for Berchtesgaden is a major recreation and vacation center for all the American troops and civilians and their families stationed in Europe. The posh Berchtesgadener Hof, which only a few years ago echoed to the "Heil Hitler" greetings of the Third Reich's rulers, is now only one of several hotels still under requisition by American authorities.

There is never a dull moment at Berchtesgaden. Entertainment abounds: all kinds of sports; visits to the bleak, bombed-out residences of former Nazi VIP's; American movies and night clubs; snack bars and real bars. In particular, the American authorities have tried hard to rouse an interest in climbing. The challenge of the peak is always there, an interesting and steep scramble of seven or eight hours with an overnight stay at a comfortable Alpine Club house; and there is a "Watzmann Club" which issues certificates to Americans who make the climb. The tour is really worth while, with a fine view and close-ups of magnificent, rugged mountain scenery, not equalled on many a higher and more difficult peak.

Despite these well-publicized attractions, the thousands of Americans in the valley rarely lift their eyes to the hills. I have been on the Watzmann three times by different routes; and, except my wife and three friends who once accompanied me, I have never seen another American on the mountain or at the cabin. On the easiest of the three summits I once saw two little children shepherded by a woman in a tailored suit and high-heeled shoes. In the course of the climb which I am about to relate, on the airy summit ridge, we met an attractive girl with an artificial leg, and her companion on the rope told us she had lost it in a bombing raid during the war. But never a fellow-American, although one hears more English than German down in the valley!

The Watzmann was probably climbed many times by chamois hunters long before anybody thought of alpinism. There is even a

bronze plaque on the summit commemorating an ascent by German royalty almost a hundred years ago. However, there is another and unexpected side of the mountain, very different from the one seen from Berchtesgaden. That is the great East Face, *Ostwand* in German, which rises almost a sheer 7000 feet from the shore of the Koenigssee. It is thus one of the great walls in all the Alps, the second highest in the Eastern Alps, exceeded only slightly by Triglav in Jugoslavia.

In its wildly romantic setting this tremendous cliff is one of the finest pieces of mountain scenery in the world. The boat glides silently across the deep green Koenigssee; great cliffs, with black fir trees clinging precariously to them, rise precipitously from the water. One flat bit of meadow is visible, with the ancient Chapel of Saint Bartholomew at its edge, a white-stuccoed little pilgrims' church with onion-shaped towers, like so many in Bavaria. Suddenly, and without warning, as the boat nears the landing stage at the Bartholomew, the whole sweep of the wall, all 7000 feet of it, breaks into view. It rises at the head of a short valley; the great vertical pitches are crossed by a series of diagonal, parallel ledges; the top is a long, serrated ridge.

The Ostwand became a sort of obsession with Johann Kederbacher, a local guide; and, after much preliminary observation and exploration, he led an Austrian tourist up for the first ascent in 1881. As is customary, they were ridiculed before the climb for attempting "the impossible." It is a tribute to Kederbacher that his first route up the wall is still the easiest, the "classical," route. What marvellous instinct he must have had to pick out his route in the jumbled chaos of innumerable chimneys, slabs, ledges and blind alleys!

It was not until the late 1920's that somebody got the idea of climbing the wall in winter, when it becomes a great tilted sheet of avalanche-swept ice. This was at the beginning of the most reckless German and Italian climbing in the Alps, which ended just before World War II with the bloody conquest of the Eigerwand. In all fairness, though, and despite statements to the contrary in the 1931 *Alpine Journal,* I think the Watzmann winter climb was, on the

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• *A.J.*, XLIII (1931), 190: "We are informed that the expedition was quite unjustifiable, and that the participants should have perished to a man." Cf. C. F. Meade's account of the second winter ascent (1937) in *Approach to the Hills* (New York: E. P. Dutton, 1940), pp. 103-14.—*Ed.*

whole, carefully planned and reasonably executed.* The participants were all thoroughly familiar with the wall in summer and had studied it with field glasses from all angles all one winter and spring. They had trained on the most difficult routes on Mont Blanc. The climb was made in 1930, from December 6th to 8th, without incident, despite a bad break in the weather, which necessitated a second bivouac just under the summit. At the time the natives took a dim view of the expedition. The young members were accused of blasphemy and godlessness for "courting suicide," and were publicly condemned in the churches and insulted in the streets of their village.

It is rare that one gets to complete an Ostwand ascent at the first try, because of the unstable weather in the deep Koenigssee pocket. Any storm that hits that part of the Alps hangs around the Ostwand extra long. Furthermore, it seems to be practically impossible to predict the weather. Even the oldest inhabitants and the guides only guess, although they always predict good weather with such assurance that the poor tourist believes them and dreams of tomorrow's sunshine while sheltering from today's rain. We gave up on our first visit after huddling miserably under a big boulder at the foot of the cliff from five to seven in the morning, waiting for the rain to stop. As it turned out, it did not stop for a week.

My second attempt—for my climbing companions it was to be, respectively, the 24th and 14th ascent of the Ostwand!—came a fortnight later, in the middle of August 1949. The first of my two friends was Hans Flatscher, a quiet, modest little mountaineer of the old school. He has only one eye—a handicap which seems not to bother him at all on the most difficult rock and ice, but which forces him to proceed with great caution along an ordinary meadow trail! The other was Toni Beringer, a leader of the first winter climb in 1930. Hans is a cable car motorman, and Toni Beringer drives a mail bus. Among their many Alpine experiences together was that of cutting steps in black ice for 13 hours up the Pallavicini ice couloir on the Gross Glockner in Austria.

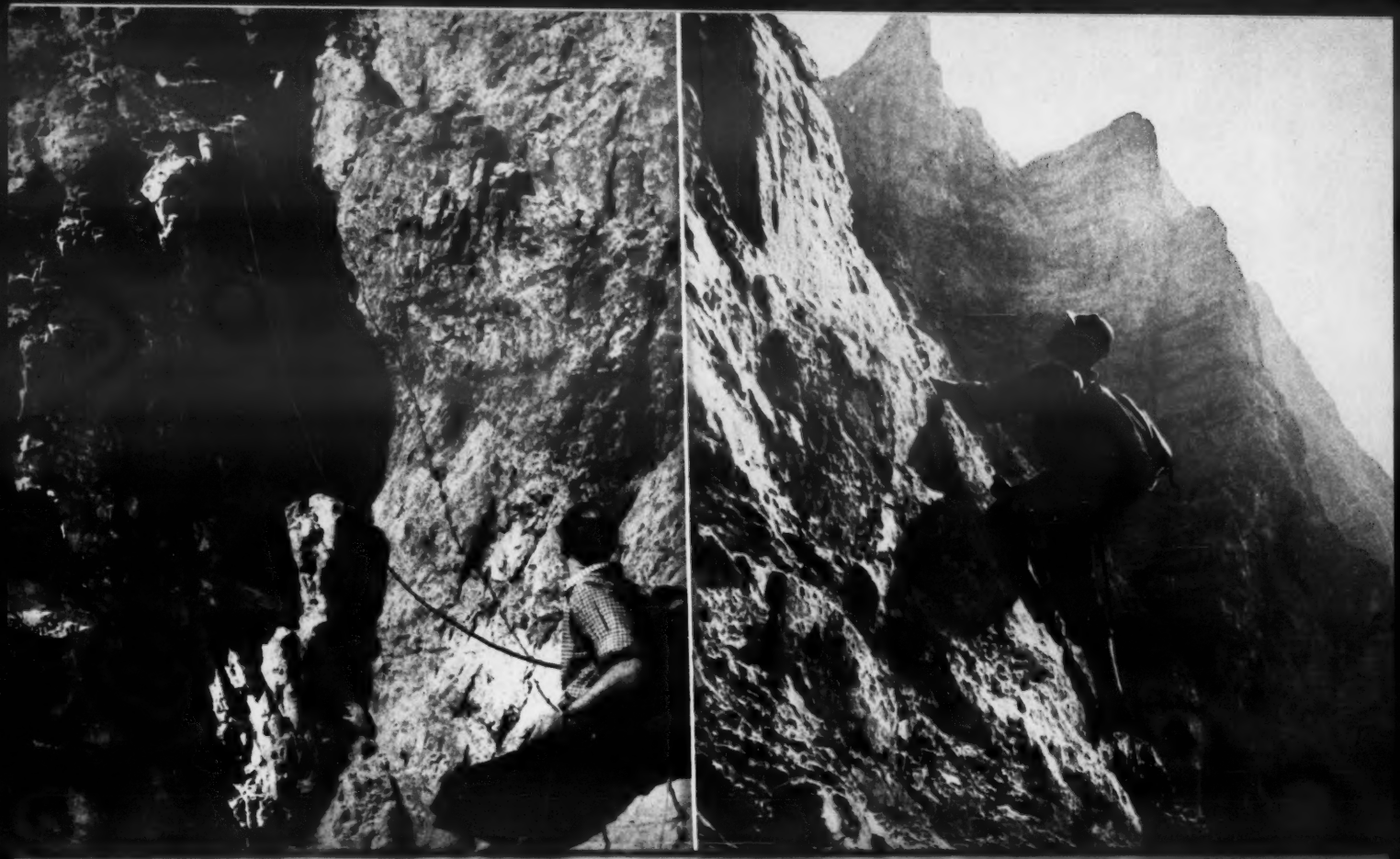
As our boat putt-putted across the Koenigssee, the usual gloomy weather outlook was accompanied by my friends' usual optimistic predictions. Despite the fame of the Ostwand and the large number of parties who climb it every year, it was only in 1949 that the German Alpine Club was able to establish any overnight quarters. All of this area used to be the private hunting preserve of Bavaria's former

WATZMAN OSTWAND

Lines indicate, from left to right, the Berchtesgaden, Munich, Salzburg and Kederbacher routes. In the German key, the significations of the letters are given as follows: E, *Eiskapelle;* BB, *Biwakblock im Schoellhorn-Kar;* SG, *Schoellhorngletscher;* SP, *Schoellhornplatte;* Z, *Zellerloch;* U, *Unterbrechungsstelle des 3. Bandes (Kaserer-Eck);* M, *Massiger Pfeiler (Standpunkt der geplanten Biwakschachtel)*

*Photo, Ernst Baumann, Bad Reichenhall*

M
U
Z
SP
SG
BB
E



royal family, the Wittelsbachs; and during the Nazi era Hermann Goering took it over. The Bavarian State, conservative to the point of idiocy where its forests are involved, will still not permit the Alpine Club to build a cabin there. Climbers used to bivouac either in the woods or in a cave rather high up on the cliff, but now the Club has the use of a few bunks in the loft of an old stable near the chapel. It was for this place we headed.

Personally, I have never felt that it was necessary to torture oneself by sleeping on hard rocks or in dirty straw the night before a big climb. I prefer the spotless, comfortable little hotel-like rooms of so many Alpine Club huts, particularly in Austria and Switzerland. Most climbers (certainly those of the "week-end tourist" variety) sleep best in a clean bed—and the better you sleep the more you are likely to enjoy the following day. Our loft, however, was passable. A thunderstorm woke us, and two mules fighting just outside, and the usual late arrivals stumbling apologetically about in the dark. But we did get some sleep. On account of the uncertain weather it was almost six before we started, Hans and Toni vehemently assuring each other and me that the day would be fine yet.

An hour's walk through the woods brought us into a mighty cirque. On three sides the Ostwand swept up to blot out the horizon. Another hour's easy scramble brought us to the first interesting problem, the Schoellhorn Glacier. This extraordinary phenomenon is a tiny living glacier, only a few hundred feet long, less than a mile high. It is pitched at an angle of perhaps 30 or 40 degrees, usually requiring step-cutting. There are some crevasses and a bergschrund which can be very difficult in late summer. The glacier is replenished every spring by the tremendous avalanches which all funnel into this spot.

At the top of the glacier we caught up with a pair whom we had been following for some time. One turned out to be Simon Flatscher, the brother of my friend Hans and a professional guide; he was leading a solid and jovial young priest. Simon had also been along on Beringer's 1930 winter ascent. The five of us stayed together, partly for sociability and partly for safety, on account of the danger of loose rocks. About this time someone remarked that our expedition was bound to be successful, being now under the protection of both American Military Government and the Lord!

The bergschrund crossing and the vertical 40 yards of rock there-

ON THE WATZMANN OSTWAND
Left: Flatscher leading "SP," the most difficult part of the Kederbacher route
Right: Near "M" on the ridge leading up to the Südspitze
*Photos, Ernst Baumann, Bad Reichenhall*

after represent the hardest part of the Kederbacher route, the so-called "key" to the wall. The rock consists of a chimney, a smooth slab and an exposed corner. Although only of climbing grade four, it seems worse for two reasons: first, the bergschrund yawns cavernously just below; and, second, the slab must usually be climbed under a small waterfall. It is not easy to concentrate with this wretched trickle of water pouring into your face and running down through your clothes, and there is no possible way to avoid it. It was at this spot that the first of the innumerable accidents on the Watzmann occurred. In 1890 a young man named Schoellhorn was killed by falling from the rock into the bergschrund. The glacier was named after this first Watzmann victim.

Just above this point, one hits the first of the three great ledges which, for short distances, offer comfortable trails diagonally up across the face of the wall. It is very easy to get lost in this area, where the scale of sizes is most deceptive, and where dangerous alternatives and tricky *culs de sac* abound. Again one must admire old Kederbacher's unerring mountain sense in finding the right route.

Halfway through the second ledge, the priest suddenly bent down with a startled exclamation and came up with a white object. "This is a human thighbone," he said, with a strange look. It was, too. I could hardly believe it, but our friends did not seem very surprised. "Oh, that happens sometimes in the Ostwand," Toni said. I was reminded of the summer of the year before, when a friend and I were poking about the meadow below the Rifugio Umberto at the foot of the Tre Cime in the Dolomites. Suddenly he leaped into one of the zigzag World War I trenches which still defile that area, and, like the priest, emerged with a bleached human bone. The man on the Watzmann at least had not died at the hands of his fellow-men.

A few minutes after this incident we picked up a potential relic, a young man of 19 spread-eagled on the rock face about 30 feet below our ledge. He had failed to locate the bivouac cave the night before, and had spent a cold and exhausting night in a drenching rain. Now, having made a mistake of judgment, he was too tired to extricate himself alone from his difficult situation. If we had not happened along, someone in a few years might have found his bones. We lowered him a rope, and he stayed meekly at our heels the rest of the way, having had enough of the glories of solo alpinism.

German climbing seems to me to have a needlessly high accident

rate, due mainly to attempts by inexperienced and ill-equipped young climbers, like this one, on the more difficult ascents. There are a great many solo climbers, and after every summer week end one reads of their accidents. The German Alpine Club carries on an educational campaign to the best of its ability. But it is handicapped by its slim resources, and by the fact that the Bavarian Alps, being easily accessible to the large centers of population, are overrun by huge numbers of people every fine week end. Also, there is still some hangover of the reckless climbing of the 1930's. The Watzmann Ostwand alone has claimed about 45 lives. Schoellhorn's was the only death between 1881 and 1922; the other 44 have occurred since 1922.

The third diagonal ledge ends at a great ridge, one of the main buttresses of the wall, which runs straight up to the South Summit. The transition from the ledge to the ridge—the "Kaserer Eck"—is the airiest bit of the whole climb, a classical *mauvais pas*. It involves a long step around a jutting rock with almost a thousand feet of space below. This is the best place I have ever seen for taking those sensational photographs with which we scare our wives and impress our friends. Simon dutifully snapped us all as we rounded the corner.

From this point on, the climb consists of steep and rather exposed slabs and chimneys, but it is easy climbing with good holds. We were now high enough to enjoy a magnificent view. Thousands of feet below us, and seemingly only a stone's throw distant, was the Koenigssee in varying shades of greens and blues, with the Bartholomew a tiny toy church in a postage stamp meadow. Across the valley rose the gray peaks of Bavaria, and behind them the snowy summits of Austria peeked forth. But the most tremendous sight of all was the thousands of feet of the Ostwand itself, surrounding us in every direction.

Up to now the weather had been good, eliciting many "I-told-you-so's" from Hans and Toni. Now the clouds suddenly closed in, and the last two hours of our climb became monotonous going in the fog—scramble up a rope's length, pay out the rope for the man ahead, roll it in for the man behind, start over. Somewhere along in here Beringer pointed out the spot where he and his friends had bivouacked the second night on their winter ascent. A half-hour later the fog suddenly thinned, and without warning we emerged into beautiful weather on the South Peak of the Watzmann. It was four o'clock in the afternoon. We had left the Bartholomew at six that morning,

entered the wall about seven, and stopped about an hour or so to eat and rest. We could now look north and west over the foothills and the green Bavarian plain, dotted with villages, and cut by the narrow, winding ribbon of the Autobahn. North of the Autobahn the huge Chiemsee glowed a dull blue-gray in the afternoon light.

Here we parted company with our friend the priest, and with Simon and our young foundling. They were descending by the shortest route to the valley, for the priest had to conduct an early mass the next morning, and the young solo climber was in no condition to do anything more that day. An hour later Hans, Toni and I set off to traverse the three Watzmann summits and descend for the night to the Alpine Club cabin on the shoulder below the last peak. This traverse is traditional, and the Ostwand climb is not really complete without it.

Our route followed the ridge along the whole top of the mountain, and in the late afternoon the chasm below us was filled with writhing masses of gray clouds. They stopped at our feet, however, except for a few tattered shreds of fog which drifted past us from time to time. It was strange to have this bleak, disturbed mass of vapor on our one side, and a clear, pleasing landscape, illuminated by the setting sun, on the other. This ridge is well outfitted with cables. Otherwise it would present considerable difficulty, particularly to people fatigued by eight or ten hours of climbing, and trying to beat nightfall to the cabin. It is still interesting climbing.

As a matter of fact, it is on this relatively easy ridge that two of the worst disasters in Alpine history took place. In the month of June 1922, a sudden change in the weather caught two parties of three and four men, respectively, on the ridge, after they had emerged from the Ostwand. Five of these seven climbers died of exhaustion and exposure. In August 1946 three more men died in the same place, within sight of aid and shelter. The prevalent post-war malnutrition may have been partly to blame for this second tragedy, for at that time many Germans were attempting climbs on rations consisting of a cold potato and a crust of bread.

It was between the South Peak and the Main Peak that we caught up with the one-legged girl whom I mentioned earlier. This successfully completed climb (she had not, of course, come up the Ostwand, but the regular route), for which she had trained long and hard with her terrible handicap, was obviously a great psychological

victory for her, and she was glowing with pleasure as she worked her way through the rocks.

After a while, with the whole Ostwand behind one, this ridge becomes well-nigh interminable. Even the trail down to the cabin from the third summit, the Hocheck, seems about as tiresome as the usual final pull *up* to a cabin after a day's march up the valley. How slowly those lights get nearer, and how completely the thought of rest and hot foods dominates us at this time! We finally pulled in about eight o'clock, having been 14 hours *en route*. Ah, the delicious taste of split pea soup and dumplings, with the moist warmth of an Alpine cabin seeping into one's bones, and the relaxing feeling of a happy and successful climb behind one!

When word got around that we had just come off the Ostwand, there was considerable buzzing about that rare phenomenon, a mountain-climbing "Ami." The hut manager, his beer-belly bulging over his leather pants, led his buxom frau and his lanky son-in-law over to our table, while the other guests looked on respectfully. Even his daughter took five minutes off from fetching and carrying beer, and we all had a few schnapps on the house.

Since Europeans insist on dedicating each sip to something, we drank to America, to Germany, to American climbing and to German climbing, to mountaineering in general, to the Alps, to the Rockies, and to quite a bit more. A sort of Alpine glow entered into all our souls. And so our Ostwand expedition ended with what must have been one of the all-time highs in German-American relations under the Occupation, an atmosphere generated not only by the spirit of schnapps, but also most certainly by the spirit of mountaineering.

# Operation Operation

Weldon F. Heald

THE operation was a success. I would live. But the doctor ordered me to remain a month longer in the hospital. He even encouraged me to hope that my insides would stop floating around and eventually settle back in their accustomed places. In the meantime, however, I must lie flat on my back and contemplate a perfectly blank ceiling.

The prospect for the summer was not pleasant.

I am one of those queer people who climb mountains under the impression that they are enjoying a particularly exhilarating sport. I had planned a Swiss climbing holiday with Pete and Mort, two other Alpine enthusiasts. My ice-axe stood ready in a corner of the closet; the battered hat which had preceded me up many a climb was poised on a near-by hook; and even my boots were pointed out toward the high places. But this summer we should not hear the ring of steel on ice and the crunch of hobnails on frozen snow; nor should we see the blue skies and the glittering, silvered peaks. While Pete and Mort swarmed over the Alps in disgustingly healthy animation, I would be smelling iodoform.

Ah, but all was not lost. There was this mind-over-matter business, and there was Baedeker's *Guide to Switzerland,* a fat little red book, much thumbed and torn. With the right attitude plus a Baedeker you can have the world at your feet. It was not easy to read flat on my back, but I picked up the little red book from the night stand and ran the pages through my fingers. Zermatt, Grindelwald, Pontresina, Chamonix—what magic names! What pictures they brought to mind! The hospital and iodoform faded away.

"I'll put one over on them," I gloated. "I'll have my climbs even if I never leave these antiseptic surroundings, nor escape from the sanitary ministrations of the impersonal young women in white."

Let's go. What shall we climb? Let's start on something easy, to limber up. Baedeker lists "Ascents from Zermatt." The Breithorn? Child's play. "Can be ascended from the Theodule Hut in 3 hours." A mere hill. The Apfelstrudel? No, wait—it's the Alphubel. Don't

like the name. It sounds mushy. Aha, here it is. The Weisshorn: "Ascended from the Weisshorn Hut by the Great Eastern Arête in 8 to 10 hours. Difficult. For experts only." The way I feel, this is my meat.

Now for a guide and a porter. I shall be orthodox even in a hospital bed. At least three men should be on a rope. By right of conquest and occupation everything above the snow line in Switzerland is part of the British Empire, and all good guides are engaged months in advance by English parties. But in this kind of climbing I can take the best guides from under Anglican noses. This delights me, for I've always wanted to do it.

I'll close my eyes and point to the list of Antons, Ottos, Adolfs, and Wilhelms which Baedeker has so thoughtfully included. Who is it? Hieronymus Julen. He'll do. I can trust a man with a name like that even if I can't pronounce it. So with Hieronymus as guide and Anonymous as porter, we are ready for the ascent of the Weisshorn, the noblest of all the Alps.

Just at this point, as we are busy about men's affairs, my starched feminine genius pokes her head into the room.

"Oh, I see you are reading. That's nice. Shall I get you another pillow?"

"No thanks," I reply, fixing her with a stern look. She little knows what dangers are ahead. "I'll ring if I want you."

She disappears. But it is comforting to know that we shall have nurses, doctors—and iodoform—handy if we slip off the Great Eastern Arête.

We start off in high spirits. The weather, strangely enough, is perfect. As the three of us swing with effortless strides along the barren slopes above the Weisshorn Hut, the upper rocks of our mountain's huge southern face catch the first shafts of the rising sun. It towers above us, incredibly high—a challenge. We are well aware of it, but say nothing.

At the Turtmann Glacier—wait a minute, let's look at the map. I thought so. Baedeker is never wrong: it's the Schalliburg Glacier. Anyway, we rope. Hieronymus is lead man, *Mein Herr* in the center, Anonymous last but not least. He has the lunch and a flask of brandy.

We skirt the yawning crevasses of the glacier, scramble up the rocks, giving a leg up here and there, circle a huge snow basin,

and finally reach the foot of the Great Eastern Arête, after straightforward going in the couloir. (Never speak of gullies or ridges in the Alps. Presumably they do not exist.)

All morning, hour after hour, we work up the glorious peak toward the indigo sky: now clambering down the south face for a short distance to turn a gendarme (not the Paris kind), then cutting steps in the upper snows past a nasty schrund and a mauvais pas or two. At last, with a "Verdammte Dummheit"—meaning "Excelsior" or "I have found it"—from Hieronymus, the summit is well within our grasp. It is all very exhilarating, with tremendous precipices dropping nearly a mile down either side of the knife-edged arête.

My enthusiasm hardly slipped a notch when Nurse brought my broth. It became for me a hero's fare of bologna, black bread and strong chicory-flavored coffee from a thermos. The view from my bed was utterly magnificent. I celebrated with a nip from Anonymous' flask as soon as the door closed.

The triumph of reaching the top of the Weisshorn in perfect condition, barely even tired, was soon forgotten in the breath-taking expanse of valley, peak and glacier spread out before us in gigantic confusion. We recognized all our old friends, and Baedeker's too, resplendently snowy in the brilliant sunshine. Across the Visperthal were the great pointed peaks of the Dom and Täschhorn, the vast rounded bulk of Monte Rosa, and south, the upper crags of the Matterhorn. An army of others stretched away to the dim horizon, running off the edges of Baedeker's map.

We were just about to examine the dizzy Zinal side of the mountain . . . "Have you had a good day?" said Nurse, entering with that professional gaiety I find most aggravating.

"Oh sure," I answered as pleasantly as a man can who has been suddenly caught in his pajamas at an altitude of 14,804 feet. "But I'm a little stiff from my—"

I was about to say "climb," but I realized that this would never be understood in a practical institution. So I sighed instead.

"Poor man. I thought you would be lonely and bored with just that old red book for company. So after I wash you—"

Imagine a grown man being washed by a nurse on the summit of the Weisshorn!

"—and rub your legs—"

*Donnerwetter!* What will Hieronymus and Anonymous say to this?

"—I'm going to read you a most entertaining book. You'll love it. It's called *Speaking of Operations.*"

# Belaying

[*Recent investigations, theoretical and practical, have stimulated renewed and widespread interest in methods of belaying. The two articles which follow, by Professor Whitney, of Harvard University, and Fred Beckey, of Seattle, will be welcomed, we believe, as contributory to general discussion. It should be understood that the articles, written quite independently, were not designed for juxtaposition in any sort of formal symposium, and that the opinions expressed are entirely the author's own.—Ed.*]

## PRACTICAL BELAYING

HASSLER WHITNEY

THE average layman, on meeting a mountaineer, exclaims, "Oh, you do rope climbing!" His idea of what is done with the rope is usually rather strange. Its main purpose is of course to increase the security of the party. The average climber, on invading the high peaks, handles the rope with some confidence, putting into practice what he has learned on the cliffs. Unfortunately, the mountain does not care where or how the climber learned his technique; it pays attention only to the realities of the situation. The presence of the rope in fact often adds but little to the safety, and may even be a source of real danger. The purpose of this article is to help the climber bridge the tremendous gap between a superficial knowledge of technique and the ability to use the rope as a true source of safety.

It is clear that real proficiency can come only through actual practice. This should go hand in hand with study, under an experienced mountaineer if possible. And one should refer back constantly to that admirable text by Geoffrey Winthrop Young, *Mountain Craft*. We cannot go deeply into theory here. Rather, we point out some of the differences between cliff climbing and high mountaineering, and hope to help convince the novice that he is not yet a true mountaineer. We start with some discussion of how the rope can in fact contribute to safety in high climbing. This will help to

show how belaying may best be studied in cliff climbing. A final section would have been omitted, except for the alarming accident rate caused by the present tendency in this country to replace hard-won knowledge by quickly-read theory.

## I. Belaying in High Climbing

Let us consider some typical situations. Mythical Mount Magnificent has a normal route, rather long and laborious, with slabs, gullies, and bits of faces and ribs, but is not considered really difficult. There is also a somewhat shorter ridge, with beautiful climbing on firm rock, some sections being quite hard. On July 6th an experienced climber, A, takes B and C up the ridge. A knows that B and C are sure-footed and of stable character. On the harder parts, A belays B, and then supervises B's belaying of C; he sometimes has B and C change places. Sometimes B and C even lead sections. A discusses basic principles during the climb; it is largely a training course for B and C. Towards the top, there are signs of an approaching storm. A considers, however, that he can get his party over and down the normal route in good time.

Before they have gone far down, the clouds close in, and the wind comes up. The rope has been considerably shortened. B and C are descending together. A has B's rope firm even while descending; he is commonly right behind B, and is sometimes holding C's rope at the same time. On some harder bits, A pauses a moment, seeing that B and C are on easy spots, then moves quickly down, still holding the rope. While descending a short chimney this way, B slips on a loose stone. A stops right where he is, holding the rope fairly taut, while B picks himself up. Only on the slabs does A send B and C down one at a time. B's and C's attention is kept strictly on the climbing, and they feel that A has full control of the situation. They arrive at the bottom wet and tired, but with a glorious day behind them. A's procedure may seem a bit scary to some; but it is quite routine to Alpine guides.

On July 10th D and E undertake the same trip. They have climbed some of the hardest spots on the cliffs back home, and are fresh from the ascent of Pointed Peak by the East Face. They are loaded with pitons and confidence. The first part of the ridge is climbed very fast. On the difficult section, E puts the rope over a convenient rock while D climbs; then D does the same for E. E gets

into a bad position, and calls out, "Have you got me?" "Wait a second," D answers. Then E gets up, not noticing that D would not have actually held him in any case. On the final wall, a piton is driven in about halfway up. Getting over the top is the hard part. Of course if D fell here, he would land on the ledge below (with what consequences?), piton or no piton.

They reach the top about the same time of day as the other party. With another storm rapidly approaching, they just have time to start down the normal route, and make out the general direction of descent before being engulfed in mist. Soon they are debating whether to go right or left; it is terribly difficult to pick out a route when you can see only a few yards. They keep the rope on, but, being hurried, belay in a perfunctory manner. Suddenly a cliff is reached. There seems no easy way out on either side. But that is surely a ledge just below. A crack for a piton is found, and D rappels down. The ledge turns out to be merely a discoloration in the rock. D wonders whether he can pull himself up the rope again, then notices that there is an actual ledge a bit farther below. Another rappel brings them to another ledge. The wet rope seems to be jammed; they cannot get it down, till, with an extra hard pull, down it comes, piton and all. Now they are really worried, feeling that they could not possibly climb up again, especially with the fresh snow and wind. Fortunately, the ledge takes them around to easier ground. They have now no idea on what part of the mountain they are. With fear of approaching dark, they hurry still more. D glissades carefully down a little snow gully. He gets back on the rocks, while E glissades. Going a bit farther, E hits an icy stretch, hidden by the fresh snow. The rope catches over a rock, and the fall is stopped. Somehow, the lower slopes are reached at last.

Two days later, rested and warmed by the sun, they start up Terrible Tooth, the dangers of bad weather in mind. But the mountain has other dangers, too. The tragic consequences are well known to readers of *True Mountain Tales.*

A's party described above may be considered entirely secure. The rope was the immediate factor in insuring that a slip on the part of B or C would not have bad consequences. Most important, A knew how to manage the party from beginning to end. On the other trip, the presence of the rope was of little physical consequence (except for the rappels). But its psychological consequence,

especially during the descent, was marked. It tied the two young men together, giving them courage to continue unfalteringly. On the other hand, it gave them a false sense of safety; in many places, a slip would have meant certain death to both. In such a situation, the individual's strength and stability of character become highly important. A person can quickly lose his morale; in a group of novices, this makes the descent terribly risky. Only the true mountaineer knows how to guide such a person safely down.

Under what conditions can one expect to belay successfully in high climbing? Let me quote from Young: "And since good men can hold almost anywhere, even while moving . . ."[1] This is a basic fact, which the novice usually fails completely to understand. He returns from a climb, and says, "There were 500 feet of slabs, with only two belay stances." The expert belayed for his party continually on these same slabs. In a party with a fully responsible leader, the rope will ensure safety throughout. Only under most exceptional conditions must the leader put his full powers into play to bring his group down without accident. Some remarks on especially difficult climbing are made in Section III below. We have not mentioned the special problems brought up by belaying on snow or ice; this requires more advanced technique yet.

## II. Belaying on Cliffs

Belaying here has two purposes: the immediate safety of the party, and training. The first purpose is sufficiently served by putting the rope around a convenient tree; but this is not usually possible on high peaks. The disadvantages of using a fixed rock for belay are discussed in Young's book. In practically all normal Alpine climbing, the body belay is the best. In particular, it is secure, and rapid, and the belayer keeps in constant touch with the man below. (As to belaying the leader, see below.) This is true even of cliff climbing. Hence the body belay should be studied thoroughly.

The beginner in belaying must of course be supervised. There are too many ways in which accidents can occur: he may be in a position in which he can not really hold (and no adequate test has been given); he may not know how to bring up the rope properly, or may simply fail to do so; he may let the rope get tangled or

[1] *Mountain Craft*, p. 214; 5th ed. (1946), p. 164.

jammed in a crack, or let it pull off loose stones; he may shift to a bad position before the climber is up. If he is tied in, be sure this rope is secure, yet without pulling on the belayer so as to help the belay (unless in a really difficult position). Remember that the climber below may act wrongly: for example, he may leap for a hold or pull on the rope above him for "extra security," thus causing a dangerous slack in the rope.

On each belay position, if the belayer is entirely sure of himself, he may call out "On belay," to be answered by "Climbing." Otherwise, "Ready for testing" is answered by "Testing." The man below gradually puts his whole weight on the rope, then gives some extra pulls, unless called on to stop. Then "O.K." is followed by "Climbing." Constant testing is the main source of security in belaying.

The normal method of belaying, the best under the vast majority of circumstances, is to stand with one foot right on the edge of the ledge, the rope coming up right beside the foot and along the leg, held firm and straight. The body is inclined somewhat inwards, with the other foot behind, for good balance. The rope is held by the other hand, at waist height; this hand must never let go of the rope. It will be used also to throw the incoming rope into neat coils (not down the cliff). The hand by the firm leg will be continually feeling the rope. With experience, one can tell whether it goes straight to the climber, and is not caught on a rock. Any change in direction of pull of the rope due to movements of the climber must be taken into account. It is good for the climber to test the belay (with warning and answer) occasionally during a climb.

Rather than climb to the top of the cliff and then belay, the climber should belay from several places on the way up. This will teach him how to belay in a variety of rock structures. With constant practice, including testing, he will learn how to hold in the varied situations he will encounter in high climbing. The higher art of rhythm in belaying, climbing up and down, is hard to learn on cliffs.

### III. Belaying the Leader

I wish to make several points here which, at first sight, may seem rather strange. I believe the lack of understanding of this

subject is having serious consequences to young American climbers.

(1) In all normal climbing on rock by safe parties, the leader is not belayed.

(2) There is a growing tendency in this country, both on cliffs and on high peaks, to belay the leader. Usually the parties are not gaining the safety they think they are by this maneuver. In fact, they are often increasing the danger.

(3) The young climber, in studying modern techniques and bringing them into play, is commonly losing sight of more basic mountaineering principles.

To discuss these points, we first consider the general problem of safety. Let us classify climbing parties roughly into groups: (a) high security, (b) medium security, (c) little security. Those in group (c) are clearly reckless; on reading of a mountaineering accident in the papers, one usually places the party mentally in this group. Unfortunately, the party usually belongs in fact to group (b); the trouble is that many climbers think that they are in (a) and that those having accidents are in (c), not realizing the existence and large extent of (b). If the leader of a party is thoroughly experienced in the type of climb he is on, and has full responsibility with respect to the state of the mountain and the composition of the party, then the party is presumably in group (a). This holds, in particular, for practically all guided parties. The less experienced climber is commonly unaware of the great variety of problems the mountain may put to him—hence his mistake in thinking that his party is in group (a).

To come to point (1), we note first that a guide taking a party up a standard route (even a highly difficult one) does not ask to be belayed. If the whole party is strong, there can be some particular places, like a short traverse, where the leader may call for a belay; he knows that a slip can have no really serious consequences. If a first-rate party attacks a most difficult route, the leader may be belayed. The climbers know that a fall may be serious, and that they are edging from (a) towards (b). In actual fact, a fall in such a party is rare. We do not call such climbs "normal." Attempts by novices to emulate these parties are foolhardy.

To explain the reason for (1), we give two more points:

(4) The purpose of a belay for the leader is generally not

to insure safety, which it can seldom do, but merely to reduce the seriousness of an accident.

(5) A leader in group (a), knowing this, is so secure in his climbing that he has no need of a belay.

Let me quote again from Young: "A leader, or a last man down, does not fall. It is the first condition of his hegemony that he must not. His fall from any height must mean injury to himself, and may involve the whole party. . . . To fall, get injured and survive in the Alps is more actually dangerous to the rest of the party than to get killed."[2] If a leader falls, no amount of theory can insure him against breaking a leg or skull, if he is any distance above his belay.

In normal climbing by a group in (a), the leader is not belayed, first, because he does not need it, and, second, because it is a waste of valuable time. The usual belaying of the leader in an inexperienced party is in fact rather ineffectual, and may even give the leader a false sense of security. This is tragically shown by the four serious accidents described in recent American Alpine Club Safety Committee Reports in which the leader was relying on pitons.

The danger in belaying an inexperienced leader may be shown by the following example. The leader starts up a difficult stretch, and soon drives in a piton. Higher, it being even harder than he expected, he drives in another. This is tiring work. Still higher, a feeling of tension grows in him about his position. Two feet above there seems to be security, with a fine climb accomplished, if he can make it. Below, there is the shame of failure—that is, if he can get down. Having done very little climbing down on difficult rock, and being worn out, he does not dare descend. At the crucial moment, he feels that the modern technique of pitons for security now comes into play. A desperate effort is made, and the accident occurs. Without pitons, the climber would not have worked himself into this position.

One may ask: Suppose the leader does not feel perfectly secure? Should he then not be belayed? Asking this presupposes that the party is beyond safe limits, perhaps getting into group (c). It is beyond the scope of this article to discuss corrective method.

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[2] *Mountain Craft*, p. 260; 5th ed. (1946), p. 211.

There is no shortcut to mountaineering experience. The mountaineer, meeting the young climber with hardware dangling from his belt, knows pretty well what to expect from him. Some pitons in the sack for emergencies such as rappels is a different story. When the climber has graduated into the top class and, in particular, can give up a climb without loss of pride, he may then if he chooses study intensively the problem of belaying the leader.[3]

## BELAYING ON SNOW AND ICE

FRED BECKEY

IN that bible of the climber, *Mountain Craft,* Geoffrey Winthrop Young wrote: "Mountaineering, like other arts, has suffered much, for all its youth, from the limitations imposed by hasty tradition and by doctrine prematurely crystallized."[1] The craft, he suggested, must be enlarged and improved by experiment. He did not regard the principles which he set forth as being above improvement; he expressed, rather, the hope that they might provide the basis for more general discussion. Young's exposition of belaying is the finest that has been published; but recent experiments have indicated that his suggestions, both for rock and for snow, can be improved. In reviewing the fifth edition of *Mountain Craft,* R. M. Leonard points out that "Young's constant reference to climbing unroped on steep snow and ice shows a realization of the basic weaknesses of belays on snow and ice."[2]

Since snow and ice permanently cover the higher peaks, the ability to climb on them safely is essential in a "compleat" mountaineer. It would appear that the reluctantly proffered suggestion

[3] The basic source is still Young. For further study, see R. M. Leonard and A. Wexler, "Belaying the Leader," *Sierra Club Bulletin,* XXXI (Dec. 1946), 68-100. A mathematical study of certain points has been made by Wexler in "The Theory of Belaying," *A.A.J.,* VII (1950), 379-405. We make a few remarks on this last article. The "dynamic belay" (letting the rope slide some) is age-old. Anyone uses it rather than be pulled off his feet. It is discussed in several places by Young. At the bottom of p. 400, "velocity" should be "acceleration"; the following analysis is incorrect. Pulling in slack if a leader falls is a common experience, especially on snow; though it is dangerous in some circumstances, it is very helpful in others.

[1] 3rd ed. (London: Methuen and Co., 1934), p. vii.

[2] *Sierra Club Bulletin,* XXX (Dec. 1945), 124.

that the leader may have to be sacrificed, in the event of a serious fall from a great height, applies to climbing on snow as well as on rock. But the present-day climber is not easily reconciled to this gloomy notion, or to the suggestion that there is no reasonably certain protection for a roped party on steep snow or ice. The best preventive principle, it is true, is that the leader should not fall; and the discovery of new safeguards should not tempt him to lessen his vigilance. Present-day climbers, however, should not on that account neglect the new techniques.

Arresting a fall is fundamentally a problem of absorbing energy. A belay must absorb the kinetic energy of a falling man in such a way that no severe load will be imposed on the man, his belayer, a piton or an ice-axe. In a "static" belay, the fixed rope alone absorbs the energy. Theory and experiment have shown conclusively that a static belay is inadequate to arrest a leader's fall. The "resilient" belay seeks to lessen the shock: the rope having been snubbed around the belayer's body, both rope and body "give" somewhat under the load. Although many climbers have recognized the importance of resiliency, "none of them"—as Leonard and Wexler wrote in 1946—"has clearly explained how to obtain it." The principle of the "dynamic" belay was therefore developed by these two climbers in the *Sierra Club Bulletin*.[3] Wexler has explained it thus: "The rope is permitted to slide, under control, over the support; and the friction generated between rope and support is the dominant factor in absorbing the energy of a fall."[4]

Repercussions of these advances appear to have been felt chiefly among rock-climbers. What about belaying on snow and ice? Some ten years ago, my brother and I found ourselves dissatisfied with the methods advocated by the various books on mountaineering technique. Having made a close comparison of the effects of numerous practice falls held by different methods, we began to suspect that a good many ideas had been expounded without adequate testing. One published sketch, for example, showed a leader secured by means of ice pitons and a shoulder belay. Further, we knew that mountaineering annals are full of accounts of falls in which the leader pulled the second man from his stance when an

[3] R. M. Leonard and A. Wexler, "Belaying the Leader," *Sierra Club Bulletin*, XXXI (Dec. 1946), 68-100.

[4] A. Wexler, "The Theory of Belaying," *A.A.J.*, VII (1950), 390.

axe anchorage failed. Such was the cause of the 2000-foot fall of Toni Schmid and Ernst Krebs on the Grosse Wiesbachhorn in 1932.[5] The dangers of a static belay are as great on snow or ice as on rock.

We have now a technique to propose. We make no claim to be the discoverers, but we believe it to be sufficiently novel to merit discussion. It is proposed now only after repeated tests by climbing associates, including Schoening, Hieb, Widrig, Sharpe and Craig.

Experiments have shown that, *if a severe fall occurs on steep snow, only a dynamic belay,* whereby the rope is allowed to slide over the belay point (ice-axe, or ice-axe arrest belay), *permits the kinetic energy to be absorbed so that the check is made gradually over the residual rope distance.*

If the axe can be driven into the snow, its use will at least somewhat improve a belayer's situation. To hold most firmly, it should be driven almost perpendicular to a horizontal plane, not at right angles to the slope. Some advocate merely holding the rope in hand, after it has been passed behind the axe and over one knee, and pressing upon the axe with the free hand, or a shoulder or knee. This method has some merit: "slack" can be given easily, and a dynamic belay effected to mitigate the force of the fall. But there are drawbacks. A hand belay affords little control: the belayer may be unable to hold a serious fall. Also, the position of the belayer—unless he is anchored to the axe, and the axe is driven deep—is none too secure. The advantage of being able to give sudden slack is hardly compensatory.

By taking one or more turns of the rope about the axe, one can gain full control of the rope; but a severe fall will tend to create a static belay, resulting in dangers already discussed, and making it possible for sudden strain to snap off the axe. This type of belay is quite permissible, however, and even advantageous, when a party is crossing gentle terrain made dangerous by hidden—or open—crevasses not in line with the direction of travel. Under such conditions, a fall will be short, and absorbed by the rope's cutting into the lip of the crevasse. The belayer can rapidly put a clove hitch and then a final anchor to the rope about the axe, and be free to

[5] *A.J.*, XLIV (1932), 348-9.

assist in immediate extrication. Experience and discretion are needed; the conditions under which this belay may be useful must be understood. If a climber is crossing a snow bridge, or travelling in line with the crevasses, or ascending a steep slope that presents the double danger of slip and treacherous crevasse, he may have a longer fall. For these conditions, the proposed new dynamic belay is recommended.

Our experiments showed that the belay which came nearest to perfection was one combining the advantages of the techniques aforementioned, and interposing the body between the rope and the axe, as in a belay on rock. The method is quite simple. Let us assume that the leader would theoretically fall left of the belayer, who should always make his stance off the potential fall line. The running portion of the rope is passed above the vertical ice-axe, and then behind the hips of the belayer (who is facing obliquely to the left) to his outstretched left hand, as in a rock piton belay. The inside (right) knee of the belayer presses against the axe, and his inside shoulder and arm press down on the axe. The angle and density of the snow determine just how this will work out: the rope may be passed above the buttocks or below, and it may be the inside shoulder, armpit or chest which is pressing upon the axe. The body is not kept erect, but planted securely in a tripod position, with the feet braced and the bent inside knee pressing hard against the axe. The inside hand grasps the axe head (pick pointing in), with the thumb under the adze and fingers over the base of the pick. This technique can be practised even when the surface is so hard that the axe can be driven in only a few inches. It is much superior to any other ice-axe belay.

If a fall occurs, the controlling grip of the gloved key hand is sufficient to bring the strain slowly to an end. Slack must be given until the peak of the shock has been passed. It must be remembered, by the way, that a belayer watching a slip may develop a dangerous tendency to "freeze" the rope. He would thus lose the value of this belay. The technique has to be practised; but one can learn, readily enough, to keep the peak load below the lowest of the breaking points of any of the links—body, rope, ice-axe. Full control of the rope can, indeed, be had with ease. Moreover, two former dangers, that the belayer may be pulled off his stance and that the axe may be torn out, are set against each other: the greater the pull of the

rope behind the axe, the greater the upward pull on the belayer, who resolves this force upon the axe and welds the belay into the soundest, solidest unit possible.

It may be well to remind the reader at this point that Wexler has shown why a leader should terminate his leads on rock so as to give the belayer a length of rope equal to one-third of the distance through which a fall would be possible.[6] Otherwise, a dynamic belay will not be effective. On snow or ice, the leader could go farther, depending upon the gradient and the frictional qualities of the slope. Although study of this point is needed, it may be estimated that at the end of a lead a length of rope equal to one-sixth of the distance of a fall should be available to the belayer.

The mountaineer will see how the leader can adapt this belay to safeguard the second man's ascent—using his inside armpit or chest to pin the axe, since he needs both hands to take up rope. I have found it expedient, when there are three on the rope, and the axe can be anchored fairly securely, for the third man to use the rope to the middle man (who is belaying the leader) as a fixed line, anchored to an ice-axe loop on the rope immediately behind the second man. The party's speed of ascent or descent can thus be made to approximate that of a two-man team. To an able climber, the fixed rope gives security; the technique can be considered safe on any but especially steep or crevassed terrain. Similarly, if the leader has a staunch belay, numbers two and three can climb simultaneously.

Sometimes unusual features of the surface make it possible to arrange a standing or sitting hip belay, permitting application of the principle of the dynamic belay, without recourse to the axe, except perhaps as an auxiliary anchor. Thus, a snow hummock, ice pinnacle, sharp arête or other protrusion may give the leader an excellent belay of the type normally used in rock climbing. Sometimes, also, a groove or circular trench may be cut in the snow or ice, and used as an anchor for a belay: the rope is passed through the groove on a lead, or snapped to a karabiner on a sling running through the groove.

When the slope is flat and the snow is so porous as to allow the insertion of the axe to the hilt, another technique that uses the

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[6] Wexler, *op. cit.*, pp. 393, 405.

tactics of dynamic belaying is recommended. The belayer passes the rope behind the axe, being careful to keep the pick in so that the rope can not escape, and presses on the axe head with the inside foot. He passes the standing end of the rope above and behind the hips, and faces the axe at a right angle to the line of fall, giving a standing hip belay.

In his discussion of belays on ice, Young furnishes excellent advice. "On hard grainy ice," he points out, "it is useless to attempt to belay the rope with the axe."[7] He continues: "On soft grainy ice it is sometimes possible to make a belay by striking in the pick at a sharp downward inclination above us, and looping the rope round the pick and close to the ice"—but he warns of the insecurity of this belay. It would be better to combine a body belay and a dynamic belay, with the rope running above the pick. On such ground, however, it would be better still to chop two good foot stances and give a standing hip belay, especially if crampons were being worn.

I think that only the use of ice pitons—though purists may despise them and trust to good fortune—can make passages on steep, hard ice safe. Full discussion of their use is beyond the scope of this paper, but a brief warning may perhaps be offered: no climber should try them on steep ice unless he is well versed in their use and limitations, and has practised with them on safe terrain. Certain of the tubular and barbed pitons are excellent for use in belaying; but one must remember that any ice piton may loosen up in a short time, despite regelation, unless the temperature is below the freezing point and the piton is concealed from strong sunlight. Ice pitons are, of course, excellent mediums for application of the dynamic belay. Tactics resemble those for rock pitons.

If the leader falls while a party is climbing in combination on snow, there is little time for the belayer to assume an adequate stance, and attempts to pull in slack rope may end disastrously. For a party travelling together on long, doubtful slopes of soft snow, Young's advice would seem still to be the best: pass the rope above the shaft, letting it rest on the snow. Unless there is imminent danger from crevasses, climbers moving in combination on steep terrain should carry some loose coils of rope in hand, for they can thus have enough rope to effect a running belay if the leader

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[7] Young, *Mountain Craft*, 3rd ed., p. 306.

falls. But on hard snow it is important to keep the rope fairly taut and rely on self-arrest, by means of the ice-axe, to stop the fall of any member of the team. In the event of a fall by the leader, this technique is "resilient" in that the second man is pulled downward for some distance before the leader is brought to a decelerating halt.

Some analyses of belaying on snow and ice fail to mention the limitations of the axe and anchor loop for a party travelling in combination.[8] Keen discernment is needed. If this is lacking, I would recommend not using the axe loop. At any rate, it can be used justifiably only when the snow is soft enough to permit quick, firm axe anchorage and there is danger from crevasses, yet no likelihood that the leader will suffer a long, uncontrolled fall because of objective difficulties. The loop must be dropped to the snow surface with instinctive quickness, if someone falls into a crevasse. Since the fall will be short, and the lip of the crevasse will have a cushioning effect, the static belay is acceptable. It should be observed that, since the axe loop should be on the rope immediately ahead of the climber, a leader would never use one. As Young suggests, the leader must have his axe free. If a slip occurs while climbers are moving in combination, every man—unless a running belay around the axe is used to halt the leader's fall—should keep *both hands on the axe*. This can not be emphasized too strongly.

## II

The desire to improve standard rope technique has led recently to the formulation of the "sliding middleman technique."[9] Instead of tying into the main climbing rope, the middle member of a trio snaps onto it by means of a karabiner spliced into the end of a short connecting rope. He ties into the connecting rope (bowline-on-a-coil) and, at the point where it reaches the snow when he stands erect, fixes a butterfly knot with a small ice-axe loop. The middle man acts as a fixed anchor or belaying point for the third man. When the party is climbing in combination, the third man carries some slack and, in case of a fall by the leader, gives a dynamic belay through the aforementioned karabiner.

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[8] Cf. D. Lind and O. Daiber, "Snow and Ice Travel," *Mountaineer*, XXXII (1939), 41.

[9] C. Beckwith, "Sliding Middleman Technique in Snow," *Mountaineer*, XLIII (1950), 19-24.

One can imagine an advantage in the use of this technique, admirable in theory, to stop a leader's fall on steep, uncrevassed snow slopes, for the division of duties facilitates specialization, and the third man could take up a little slack while the leader was falling. The principal disadvantage is that the stability of the middle man (or anchor) would be uncertain in the event of a hard fall, as the force would tend to pull him off the slope rather than up. Less vital but equally obvious defects are that the technique would be impracticable if there were any danger of falling into a crevasse, and that the leader could not hold a slip by the middle man until he had slid half the rope-length and struck the third man—unless knots were tied all along the rope behind the middle man, in which case the whole point of the technique would be nullified.

It is alleged that standard rope technique has shortcomings: anchor security or rope control is sacrificed when one man must attend to both simultaneously; the third man can give only moral support; anchoring time is short when the rope is taut; restriction of leads makes the technique awkward, slow and inflexible. Proponents of the "sliding middleman technique" claim that it yields greater climbing speed, efficient use of two men to control a fall, flexibility in the choice of anchors, smoothness of braking due to the sliding of the karabiner, and more time to cope with unexpected falls.

Let us examine these allegations and claims, recalling as we do so that the "sliding middleman technique" has been described as "still in an experimental stage." Giving an account of it in *The Mountaineer* for 1950, Cameron Beckwith writes, "Perhaps it holds the answer to many of our snow-climbing problems but we doubt that it will ever be a magic cure-all for them all."[10]

Owing to the ease of control through balancing of forces in the belay previously discussed, standard technique need not be considered the weaker just because one man must attend simultaneously both to anchor security and to rope control. Indeed, one man in complete control can tell more accurately how much slack or how much pressure will be required to stop a fall than two men work-

[10] *Ibid.*, p. 24.

ing independently, neither of them fully aware of the strains on the other.

Standard technique allows the third man to give more than moral support. In a dangerous spot he may move up and give an auxiliary anchor to the second man; if he is below, he has ample time to prepare an arrest. It is true that the time for anchoring is short if the climber who slips is behind; but a quick axe arrest with little impact is much to be preferred to a time-lag and a greater jerk, due to the middle man's sliding free half the rope-length or the last man's sliding some 15 feet.

For a practised party, standard technique need not mean slow and awkward movement. The third man can often use the rope as a fixed line while the leader is being belayed, thus speeding the ascent; or an end man may belay while the other two move simultaneously. It has been suggested that a party using the "sliding middleman technique" may increase its upward speed by having the middle man anchor through the axe loop while both end men move together. But there is no mention of the danger of a fall by the last man: the force would come entirely on the leader, who might be in a precarious position at the time.

The criticism that standard technique is inflexible seems hastily conceived, for it can be the more flexible of the two. If difficulties are expected, a trio will generally use two ropes (always handy for extrications from crevasses), with the members separated by about 100 feet. The total length of the ropes could be over 200 feet—a length occasionally of advantage on a long, treacherous pitch in that one end man may be able to keep a solid belay. The proposed technique, however, allows only one rope-length. Furthermore, it can be used only by a team of three or of some multiple of three. Without intending to advocate two-man parties, I should still say that they are sometimes necessary, and that on expeditions climbers generally rope in pairs. Where varying terrain—snow, ice, rock—must be traversed, as frequently on a big mountain, the proposed technique would not be satisfactory.

I can not be persuaded of the advantages claimed for the new technique. Unless risks are taken, neither method can much increase a party's speed of climbing. Standard technique is the safer when two are moving and a third is anchoring or belaying. Specialization does not necessarily mean more efficiency in belaying; it

may mean less, as has already been suggested. The leader has no more freedom of movement; if circumstances require an unusually long lead, he has less. The two techniques give the middle man equal opportunities to find the best belaying point. The suggestion that the rear man can take up lengths of slack while the leader is falling is difficult to accept, for in a real fall there is not much time to do this, and there is much danger of losing proper control of the rope in an attempt to do it.

Advocates of the proposed techniques have apparently not perceived that, when a leader must be held, the mechanical advantage of the karabiner as brake-pulley is something of a boomerang. Stopping a fall is easy only when a great deal of slack is available. Let us assume that the leader falls and exerts downward pressure of 1000 pounds, the forces being along the fall line of the slope. If the pulley action of the rope through the karabiner is perfect, the instantaneous downward force which the belayer must exert to counterbalance this force must be 1000 pounds. The sum of these two forces must equal the single upward force on the karabiner and middleman anchor—2000 pounds. In a prepared belay position, the upward force would be 2000 pounds in either case; but an analysis of comparative situations indicates that the dynamic ice-axe belay makes for a much sounder position. Not only does the friction of the rope biting into the snow behind the axe mitigate the force more than the friction on the karabiner, but the rope does not tend to pull the axe laterally out of place, as it does in the proposed technique.

Consider now a party using standard technique and climbing continuously. In the event of a fall by the leader, if we assume the forces aforementioned, the upward force on the middle man using the ice-axe self-arrest will be only 1000 pounds, for the force on the belayer equals the force on the leader. If the "sliding middleman technique" were employed and a non-dynamic belay given, the force on the middle man would be 2000 pounds, for the force on the anchor theoretically equals twice the force on the leader. It can be seen that the middle man is the weak link: only perfect application by trained climbers can make it likely that the 15 to 20 feet of slack will be used correctly—that is, in such a way as to ease uniformly to some smaller value the force on all members. Theoretical examples indicate that, in a party climbing in combination,

the belay would have to be almost perfect in order to make the force on the middle man less than it would be if standard technique were used.

More dangerous features of the "sliding middleman technique" have yet to be mentioned. If the last man slips while a party is moving together, almost all the force will be on the leader, for on most climbs positions are likely to be closer to the fall line than the advocates of the proposed technique suggest. And what if the middle man slips? Think of the sudden force on the leader (who may not be in a position secure enough to enable him to cope with the fall), and of the possibility of a collision between the middle man and the rear man. If the first two men both fall, the shocks, it is true, should not come simultaneously on the third man, as in standard technique. But the first man and the second may collide; and the third, concentrating on taking in slack, will be lucky if he gets his axe in position quickly enough to stop the fall. If the middle man slips at a time when the party has a fixed belaying position, he may (again) strike the third man with much force. The leader must bear the force of such a fall—yet it is suggested that he should anchor the rope statically.

In crevassed terrain, the middle man is to move across a taut rope on his karabiner. The circumstances are hard to visualize, because most routes are not along a straight line. If the middle man breaks through, he will hang and slide (laterally, perhaps) to the lowest point of the rope. A Bilgeri rescue will be impracticable unless the fallen man can fix the karabiner securely by slings and be certain that it will not slip. Otherwise, he may find himself at the bottom of the crevasse when one of the end men unties. On crevassed terrain, a party would have to carry a second rope to be safe. An escape by Prussik sling would be difficult; and, if the karabiner on the connecting rope were buried in the lip of the crevasse, it might be very difficult, if not impossible, to tie slings above it. What if the middle man is injured? If the leader falls into a crevasse, the axes will be all tied up in a belayed situation, as no assistance can be given until the rope is firmly anchored—a process during which the leader may be dropped further. If the last man falls in while the party is travelling together, he will have an extra drop of 15 feet—the length of the slack usually to be carried by him. Perhaps the most annoying feature of the technique

is that the end men can not prevent short plunges by the middle man. In most cases, these are merely "step-ins," such that an end man can jerk the middle man out before he falls from sight. I can suggest an improvement: when the party is travelling over crevassed terrain, let the middle man snap into a loop in the rope. But that would be an implicit admission that the technique is not quite practical.

JACK SCHWABLAND GIVING DYNAMIC ICE-AXE BELAY
*Photos, F. Beckey*

30
Dinwoody Glacier

# American Alpine Club Research Fund

## 15. GLACIERS OF THE GANNETT-FREMONT PEAK AREA, WYOMING

MARK F. MEIER

IT was the author's privilege to spend the summer of 1950 studying the glaciers of the higher regions of the Wind River Mountains. This study was made possible largely by the aid of the American Alpine Club Research Fund. The author wishes to take this opportunity also to thank a number of persons who very generously assisted him on the project. Among them are Professor F. M. Fryxell, Dr. David M. Delo and, most particularly, Professor A. C. Trowbridge, who directed the study. Mr. Charles F. Darling acted as field assistant and proved to be a most able collaborator.

### *I. General Description*

Glaciers of the Wind River Mountains occur generally at high elevations along the Continental Divide. The greatest concentration is along the east slope of the Divide from Gannett Peak (13,785 ft.) to Knife Point Mountain. Most of the area is accessible only on foot, and only two brief descriptions of the glaciers have been published.[1]

The largest known glacier in the range is Gannett Glacier. As measured by maps constructed by the author from aerial photographs, it has an area of 1.77 square miles or 1130 acres. In the area studied (from Bastion Peak south to Knife Point Mountain) were found seven ice masses larger than Sperry Glacier (Glacier National Park), now the largest body of ice in other ranges of the Rocky Mountains of this country.

Morphologically, four of the ice masses in the Gannett Peak-Fremont Peak area are valley glaciers; two are large, palmate cirque glaciers; and ten are small cirque glaciers. Many vestigial glaciers or glacierettes occur throughout the range.

[1] C. K. Wentworth and D. M. Delo, "Dinwoody Glaciers, Wind River Mountains, Wyo.," *Geol. Soc. Amer. Bull.*, XLII (1930), 605-20; D. M. Delo, "Recent Recession of Dinwoody Glaciers" (abstract), *Geol. Soc. Amer. Bull.*, LI (1940), 1924.

FIG. 1. UPPER PORTION OF MAMMOTH GLACIER
Taken from point on sharp ridge which encircles southeast margin of Minor Glacier, looking south-southeast. Twin Peaks in center of background, and Mount Woodrow Wilson on extreme left

FIG. 2. POSITIONS OF TERMINUS OF GOOSENECK GLACIER
Gannett Peak (13,785 ft.) in background

*Photos, M. F. Meier*

### *II. Typical Glaciers*

Mammoth Glacier is the only large glacier west of the Divide. It is a valley glacier nearly two miles long, and has an area of about 1.55 square miles. The terminus now extends about 0.3 miles farther than is shown on the U. S. Geological Survey Fremont Peak quadrangle (1909), but this discrepancy may be due to generalized mapping. This glacier carries more flour and silt in relation to its total load than do other glaciers in the area, probably owing to comparative vigor of bedrock erosion and to absence of high cliffs bordering the ice which might supply coarse debris by avalanching. No medial moraines or dirt bands were observed.

Dinwoody Glacier is the most accessible of the Wind River glaciers, and was studied in most detail. It is a palmate glacier lying in a large, compound cirque. Excluding one small, separate ice mass (Gooseneck Glacier), which was connected to the main glacier in 1930, the area of Dinwoody Glacier is 1.34 square miles, and thus is the fifth largest of the glaciers studied. The central portion of the glacier is nearly flat and rather poorly drained, and "snow swamps" are frequent. The surface of the glacier is covered with much coarse debris from avalanching and from the coalescence of medial moraines.

Upper Fremont Glacier (one of the Bull Lake Glaciers) consists of two parts. A higher ice mass, resting on the gently-sloping east flank of Fremont Peak, tapers to a narrow throat; this constriction feeds a lower cirque-type glacier. That there is an actual transfer of ice through the steep, narrow throat is indicated by evidence of crevassing beneath the snow and by the pattern of dirt bands on the glacier below. This glacier has a low average gradient, and is eroding only slightly.

### *III. Regime*

Inferences on the regime of a typical Wind River glacier during the 1950 season are based on a series of measurements on Dinwoody Glacier. The surface ablation[2] on a water-equivalent basis was

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[2] This was measured from late July until the beginning of winter snow in September. The values given here include ablation extrapolated to the beginning of the season. Because of the abnormally late spring in 1950, this early ablation was probably a minor portion of the total.

found to vary from 112 inches to 17 inches; the average over the glacier was about 52 inches. The maximum rate of ablation recorded was 3.4 inches per day over a three-day period. Recent work[3] has shown that the sum of total accumulation and total ablation at the firn limit is a close approximation to the regime of the glacier as a whole. Based on this observation, the sum of accumulation and ablation over the entire glacier has been computed to be about 44 million cubic feet (3.6 mill. $m.^3$ per $km.^2$), and the excess of accumulation over ablation to be about 11.6 million cubic feet (0.94 mill. $m.^3$ per $km.^2$). The average accumulation over the glacier must have amounted to more than 80 inches. This large figure is explained partly by wind-drifting of snow into the protected cirque.

Since nearly all glaciers are retreating at the present time, these regime figures must be regarded as unusual. In 1950 a heavy winter snowfall in the mountains was followed by an exceedingly late spring, causing an increase in total accumulation and a marked decrease both in length and vigor of the ablation season. At the end of the summer only 34% of the area of Dinwoody Glacier was below the firn limit, and on many glaciers this figure was even lower.

The fact that this positive regime is not typical is indicated by many evidences of present-day retreat of Wind River glaciers. All the glaciers visited had receded considerably since the construction (probably in the late 19th century) of large terminal moraines. The terminus of Dinwoody Glacier is now located over 900 feet from the crest of its moraine, suggesting a thinning of 250 to 300 feet. Photographs taken in the period from 1930 to 1940 show very rapid recession. During this time Gooseneck Glacier separated from Dinwoody Glacier proper and retreated nearly 2000 feet up the lower slopes of Gannett Peak (Fig. 2). Since 1940 the general recession has slowed appreciably, and since 1945 the terminal retreat of some glaciers has become practically negligible. There is abundant evidence of thickening of snow fields at high elevations in recent years, but probably the general retreat and thinning at moderate and low elevations are continuing.

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[3] H. W. Ahlmann, "Glaciological Research on the North Atlantic Coasts," *Roy. Geog. Soc. Res. Ser.* 1 (1948), 55-56; C. C. Wallén, "Glacial-Meteorological Investigations on the Karsa Glacier," *Geog. Annalen*, XXX (1948), pts. 3 and 4.

*IV. Surface Features*

Prominent on Dinwoody Glacier are medial moraines, consisting of a surface concentration of angular debris arranged in lines parallel to the flow of the glacier, and originating below the confluence of tributary glaciers. Apparently these do not result from the junction of two lateral moraines, but are formed from material which has been deposited in randklefts (moats) at the sides of tributary glaciers, and brought to the surface well down on the main glacier by rotational motion of the central body of ice.

Dirt bands, either parabolic or irregular, are noted on many of the Wind River glaciers. These are believed to represent annual banding of the type described by Fisher[4] as Alaskan-type bands. Below icefalls these bands are highly contorted by folding and thrust faulting (Fig. 3).

Some curious detrital ridges emerge from beneath the terminal ice of several glaciers. These are flat-topped, up to 15 feet high and 15 feet wide on top, sinuous and sometimes branching; they seem in all cases to be parallel to subglacial drainage. The ridges are composed mainly of sand and gravel, with some larger blocks. No foreset bedding could be observed, but one ridge showed traces of crude topset bedding. It is thought that these are esker-like features deposited in choked subglacial stream channels.

Numerous grasshopper remains, poorly preserved and often flattened, were found only on Minor Glacier. In times past, grasshoppers have been reported from other Wind River glaciers. Why they are now confined only to Minor Glacier is not clear.

A low rock nunatak on Gannett Glacier was visited several times. On the upstream side the ice had separated from the rock, and it was possible to travel back under the glacier for over 100 feet. Far back under the glacier several roles or tubes of ice, like toothpaste squeezed from a tube, emerged from a point where ice was tightly pressed against an obstruction of rock. It is believed that the pressure of ice perpendicular to the obstruction was here sufficient to exceed the yield stress of ice, and to cause this ice to be extruded plastically. When the pressure is released, the ice becomes hard and brittle, preserving the extruded shape. Many crystal rubbings of ice crystals were taken at this interesting location.

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[4] J. E. Fisher, "Dirt Bands," *A. A. J.*, VII (1949), 309-317.

Klondike Lake
11201
Klondike Creek
Dinwoody Creek
Horse Ridge
GANNETT PEAK CAMP
The Horn
Dry Creek
Bastion Pk.
Rampart Pk.
Gannett Glacier
Desolation Pk.
Mt. Theodore Koven
West Sentinel
Seal Lake
Inner Glacier
GANNETT PEAK
13785
Gannett Gl.
Gooseneck
East Sentinel
Heap Steep Peak
Chimney Rock
13340
Pinnacle Ridge
Baby Gl.
Dinwoody Glacier
Mammoth Glacier
Mt Woodrow Wilson
Dinwoody Pk.
Mt. Turret
Mt Whitecap
G-4
The Sphinx
Mt. Warren
13720
Split Peak
Twin Peaks
Sphinx Glacier
Helen Glacier
N. Fork Bull Lake Cr.
Winifred Pk
Twins Glacier
Mt Helen
13600
Lower Fremont Glacier
Mt. Sacagawea
13602
Bow Mtn
Mt Arrowhead
G-15 ( Six Ocean Pk.)
G-16
G-17
Upper Fremont Glacier
Thumb Lake
FREMONT PEAK
13730
Knife Point Glacier
Glacier Crest
Indian Pass
12130
Knife Point Mtn.
12007
MAP OF
NORTH – CENTRAL
WIND RIVER MOUNTAINS
WYOMING
Miles
Feet
N
Compiled from U.S.G.S. and U.S.F.S. maps, aerial and ground photography, and other sources.
M. F. MEIER ~ 1950

This brief study probably serves to introduce and suggest more problems than were solved. Some of the more important areas for further study might include investigation of the glaciers farther north of Gannett Peak; determination of velocity of flow at different points on Dinwoody Glacier (this would require use of a precise transit or theodolite); and a meteorological study of regime. Future measurements of the retreat or advance of these glaciers may be facilitated by my set of photographs taken from marked locations, which show the snouts of the 12 glaciers visited.

## 16. THE JUNEAU ICE FIELD, ALASKA, 1948-51

MAYNARD M. MILLER

The success of advanced techniques employed by glaciologists in Europe in the past several decades and an ever-increasing interest in the northern frontiers of our own continent, because of recent world events, have added considerable impetus to planning for the Juneau Ice Field Research Project. Initiated in 1948 and continued through the summer seasons of 1949 and 1950, with the enthusiastic support of the Office of Naval Research, the American Geographical Society and a number of other Government and civilian agencies, this project has had for its primary objective achievement of a full-scaled systematic study of one of the largest remaining centers of highland ice on the North American Continent.

The Juneau Ice Field, chosen as the locus of our project, is uniquely situated to serve as a field laboratory for a long-term integrated research program. Lying at the crest of the Alaskan Coast Range, at approximately latitude 58° 40′ N., the region of activity encompasses approximately 750 square miles of interconnected glaciers and highland névé. It offers an opportunity for the thorough study of various phases of glacier science both at low altitudes and at the upper levels. The accessibility of this ice field is a particular advantage—coupled, of course, with its unique scientific interest.

The main base camp, located near the center of the ice field, is less than 40 air miles north of Juneau, the capital of Alaska. Civilian air service is available from that city for charter flights. In addition,

FIG. 3. CONTORTED DIRT BANDS
Exposed in a randkleft below a heavily crevassed area on Dinwoody Glacier. Note folding and thrust faulting

FIG. 4. BENEATH GANNETT GLACIER
Chuck Darling, who assisted the author in the field, is sitting on bedrock, with the glacier passing over his head. The peculiar gray mass behind him is extruded ice which is entirely separate from the ice above

*Photos, M. F. Meier*

excellent air fields in the area provide bases for the Government aircraft cooperating in the project. Besides aiding immeasurably in the transport of equipment and supplies, the use of aircraft has enabled a number of scientific advisors and specialists, who could not otherwise have visited the area, to work on the project for short periods of time. Besides its accessibility by air, several usable routes permit one to reach the locale on foot, since the western fringes of the ice field lie only about a dozen miles from the city limits. The nearness of river boat facilities and the availability of a major center of expeditionary supply at Juneau, together with the previously mentioned factors, make the Juneau Ice Field a much more practical area for such research than almost any other in the Western Hemisphere.

Six men took part in the five-week reconnaissance expedition in 1948.[1] Valuable information was gathered, not only on the nature of the terrain and on weather conditions, but on equipment, food and expedition techniques for living and conducting research on a sub-arctic ice field. A series of glaciological, botanical and meteorological observations was begun to pave the way for a more extended research program the following year.

During the winter and spring of 1949, a full program of geological, meteorological and ecological investigations, as well as the strictly glacial study, was organized. A total of 25 civilians participated in the summer season's work. A 12-man nucleus was maintained at the high-level camps through most of the 105 days the project was in the field.

A main meteorological and research station was constructed during this second field season on a rock island on the upper Taku Glacier, 16 miles above its tidal terminus. This is a well-insulated, wooden-framed and aluminum-sheathed building, equipped with living facilities, provisions and scientific instruments both for summer and winter investigations. This central station serves as the logistic and communications hub for field work extending to the 18 outlying camps. Established for the use of field parties, these camps have been supplied with equipment and provisions, and caches are being maintained for future use.

Much of the delivery of this equipment has been accomplished

[1] M. M. Miller, "1948 Season of the Juneau Ice Field Research Project," *A. A. J.*, VII (Jan. 1949), 185-91.

ALUMINUM-SHEATHED CABIN AT CAMP 10, UPPER TAKU GLACIER

CAMP 10 B, UPPER TAKU GLACIER

*Photos, W. O. Field*

through the cooperation of the Air Force's Tenth Rescue Squadron. On the flat névé of the Taku Glacier one mile west of the main base, a ski-wheeled C-47 effected 22 landings during 1949 and 1950. With jet-assisted take-offs, this large airplane was successful in bringing in many tons of equipment and supplies as well as in transferring personnel to and from the ice field. In addition to this Air Force support and that of the Office of Naval Research and the American Geographical Society, considerable material support for our work has been given by the Department of the Army, the United States Forest Service, the United States Geological Survey, the Weather Bureau and a number of civilian agencies.

The Arctic Institute of North America also contributed to the project. Its efforts in connection with a cooperative and correlated project on the Seward Glacier in Canada's Yukon Territory during the summers of 1948 and 1949 should also be mentioned here because of the pioneer work it has accomplished in helping to initiate this type of field research in America.

The results of our 1949 season were so gratifying that it was decided to send a party in for another season. So, in 1950, we began our third field season on the Juneau Ice Field, during which 110 days of field work were accomplished. A total of 29 men participated in this phase of the project, with a nucleus of 14 men being maintained on the ice field during most of the season.

A number of interrelated studies pertaining directly to the physical nature of snow and glacier ice have been carried out on the Juneau Ice Field during the past three years. Only some of them can be mentioned here. They included studies of the firn to determine its water content; of the manner and rate of meltwater circulation, density and structure; of the annual accumulation of snow during as many previous years as could be detected; of surface movement of ice in different areas and of ablation of the surface at different points on the névé; and of the maximum height of the summer snow line at the end of the melting season in September. Several of the techniques employed have been experimental and previously untested.

GLACIAL STUDIES

Top, left: Toothed ice corers, used for obtaining samples of known volume from pit walls for analyses of density and liquid water content

Top, right: Stanford seismologists (left, S. W. Miller; right, C. F. Allen) adjust their geophysical equipment for depth determinations on Upper Taku Glacier

Bottom, left: Dr. Henri Bader studies samples of ice from drill hole on Upper Taku Glacier

*Photos, M. M. Miller*

Bottom, right: Sprinkling insoluble lead oxide dye on the névé at Camp III (September 1948), to record level of late summer ablation surface. Wooden stake implanted to record surface movement by instrumental means

*Photo, W. R. Latady*

In the summer of 1950 a Rotary Pioneer Straitline Drill Rig on loan from the E. J. Longyear Company, of Minneapolis, was used to obtain samples of névé and undisturbed ice cores at a depth of nearly 300 feet. This is the first successful core drilling of a temperate glacier in the Western Hemisphere, and the results will serve as a valuable adjunct to the results of drilling in polar ice being undertaken by the joint British-Scandinavian Expedition to the Antarctic during 1949-1952. Petrofabric studies of ice cores were conducted in a cold laboratory dug into the névé near the site of this drilling. There, under polarized light, mineralogic and petrofabric analyses were made on ice cores brought up from drilling to depths of 150 to 292 feet.

Meteorological records were begun at six high-level stations. We were particularly fortunate in this work in having available to us, for comparison with our records, data from a number of near-by meteorological stations, one with weather records as far back as the 1880's. This represents a longer period of standard observations in proximity to an ice field than at any other glacier locality in America. A staff of at least three meteorologists was maintained continuously on the ice field during both the 1949 and 1950 seasons. Observations were obtained not only at the main central research station, but also at various intermediate stations. Studies were made of variable wind, humidity and temperature conditions, from the névé up to 40 feet above its surface. An accurate record was obtained of duration of sunshine and the actual caloric amount of insolation received at this latitude. The relation of ablation and meltwater rates was investigated for correlation with the amounts of solar radiation, and the temperature of rainwater, wind effects and other factors controlling surficial changes in the névé and the drainage of melt water. Such data will aid in evaluating the radiation heat budget of the ice field as a key to understanding what quantitative effect meteorological and climatological conditions have on the regimen and the post-maximum glacial fluctuations in this area and at this latitude.

Other members of the field party were engaged in mapping the region and in carrying on geological and botanical observations. During the past two seasons, several members of the field party have been mapping and studying bedrock outcrops and transferring

geological data on vertical aerial photographs taken by the United States Navy in 1948. An extensive collection of geological specimens has been made for petrologic analysis. A three-man low-level team and a high-level plant ecologist were made a part of the general program of study. Their detailed studies revealed much of interest both to glaciologists and to plant ecologists.

The geomorphic history of the ice field and its related glaciomorphological features is being interpreted in order to correlate with studies of snow and ice as well as with the botanical investigations made in the peripheral portions of the area. The bulk of this phase of the field work, however, is yet to be done in the 1951 summer season.

Meanwhile, the geophysical team in 1949, under the direction of Dr. T. C. Poulter, accomplished its studies of ice thickness on the Taku Glacier. This ice stream was selected because of a unique situation existing there. The Taku Glacier has been advancing since about 1900. In 1890, the United States Coast and Geodetic Survey mapped the inlet and made soundings nearly to its tidewater terminus. By a computation of the elevation above sea level of the present ice surface, the total thickness of the glacier can be determined. Such a combination of factors, probably not found anywhere else in the world, provides unusually favorable circumstances in which to test the equipment and methods for measuring the thickness of ice. The method used, in which light charges are set off above the surface and the travel time for the resulting seismic waves measured, was devised by Dr. Poulter while he was acting as senior scientist on the Second Byrd Antarctic Expedition, 1933-35. Our program permitted the first successful test and refinement of the Poulter seismic method on temperate glacier ice since its development on polar ice.

Another significant program of research was begun in 1949 by the plant ecology team under the direction of Dr. D. B. Lawrence, of the University of Minnesota. He has assembled sufficient data from tree-ring studies on recessional moraines of five outflowing glaciers to formulate a rather convincing theory of synchroneity of six centuries of glacier variations to dated sunspot minima, and hence to what may be a causal relationship with extraterrestrial variations in solar radiation. The unique opportunity

afforded by such botanical methods was extended in 1950 to a detailed pollen analysis of selected horizons of ice, snow and even muskeg in order to determine their age and structural relationships.

In addition to the basic scientific observations, a program of food and equipment testing and logistic experimentation has been carried out each year. A minor medical research program has been initiated, and information pertinent to emergency and practical expeditionary techniques has been gathered. Perhaps most important of all, a number of scientists have been trained in the techniques of field work on glacier, mountain and arctic terrain, and a number of young scientists have become vitally interested in the work of this project and other field studies in northern areas.

Our research station on the Juneau Ice Field is only a beginning. A small research party went in to the ice field by ski-plane during January and February 1951 to continue some special observations under severe midwinter conditions. This six-man party found much of interest in the understanding of the ice field's year-round regimen. Sub-zero temperatures were encountered during most of this period, and up to February 1st approximately 20 feet of new snow had fallen at the main base. Instruments left on the ice field the previous summer were read, and a special winter program of snow, ice, and weather study was commenced.

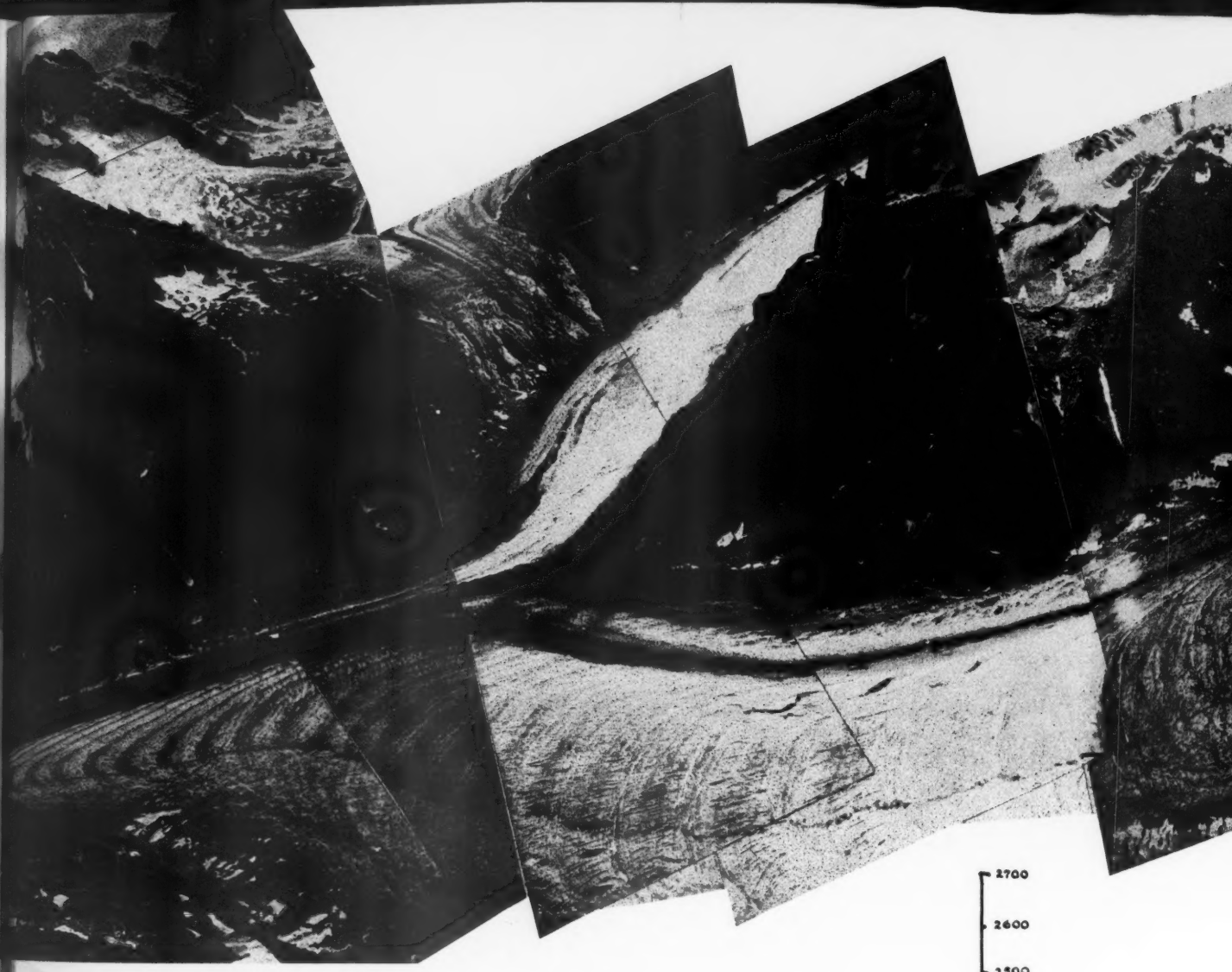
It is our hope that we may extend these detailed investigations in the years to come, on a periodic, and perhaps occasionally on a year-round, basis. We also hope that institutions and individuals will continue to show the same high interest and give the same fine support which has enabled us successfully to carry on this program of basic field exploration and research in these past four years.

## 17. DIRT BAND PROJECT

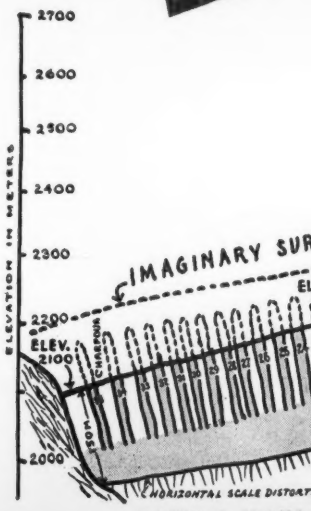
JOEL E. FISHER

In August 1946 an experiment was started on the Glacier du-Géant-Mer de Glace above Chamonix.[1] The object was to gain

[1] *A.A.J.*, VI (1947), 328-32.



*Composite Photo by J. E. Fisher*




PROFILE ALONG

## *The Mer de Glace*

## *from the Dent du Requin, July 14, 1950*

To the right, the sa[redacted]e, with cross-sections.

SURFACE OF GLACIER, WERE SURFACE ABLATION NON-EXISTENT

ACTUAL PRESENT SURFACE OF GLACIER

ELEV. 2300

ELEV. 2200 M.

REGION OF FRACTURE ONLY

REGION OF NO FRACTURE FOR ICE

ROCK BED

TOP OF ICEFALL

ELEV. 2700 M.

TINTED AREAS DENOTE REGIONS WHERE FIRNIFICATION WAS ACCOMPANIED BY AMPLE SURFACE MELT-WATER

STORTED WERE BY PARSPECTIVE

NG CENTER LINE OF BANDED STREAM OF MER DE GLACE AS VIEWED FROM DENT DU REQUIN

(JULY 195

ELEV. 2700

W.

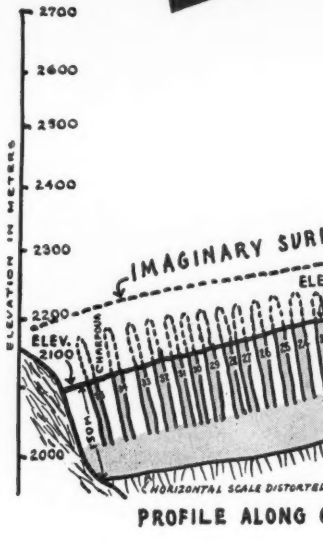
E.

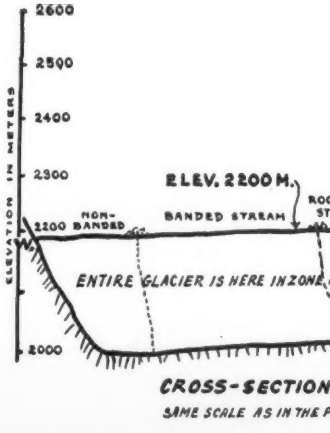
*omposite Photo by J. E. Fisher*

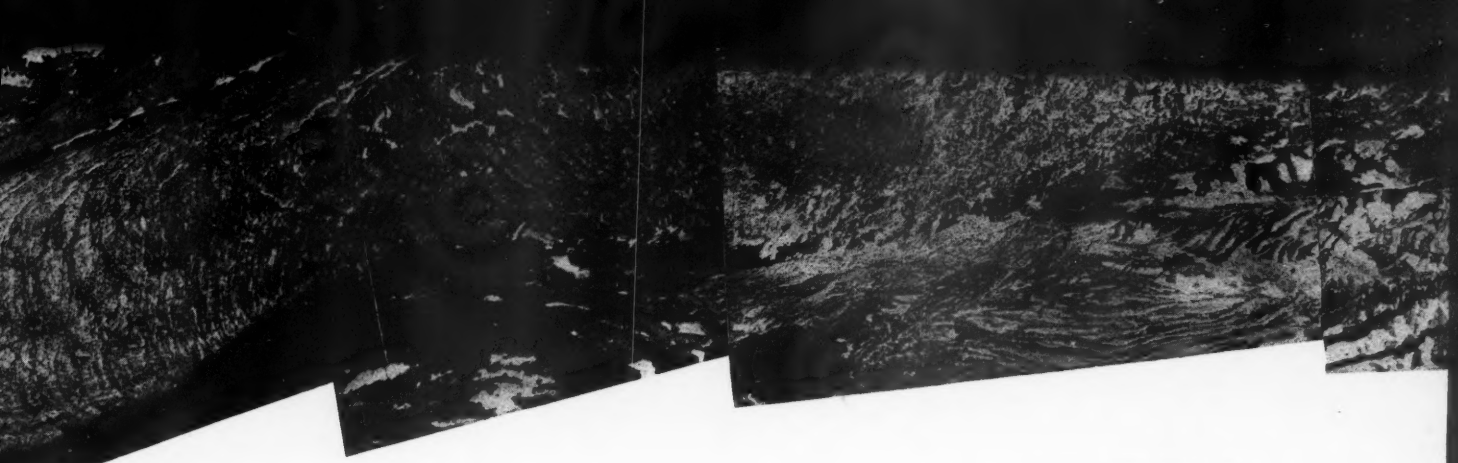
## *The Mer de Glace*

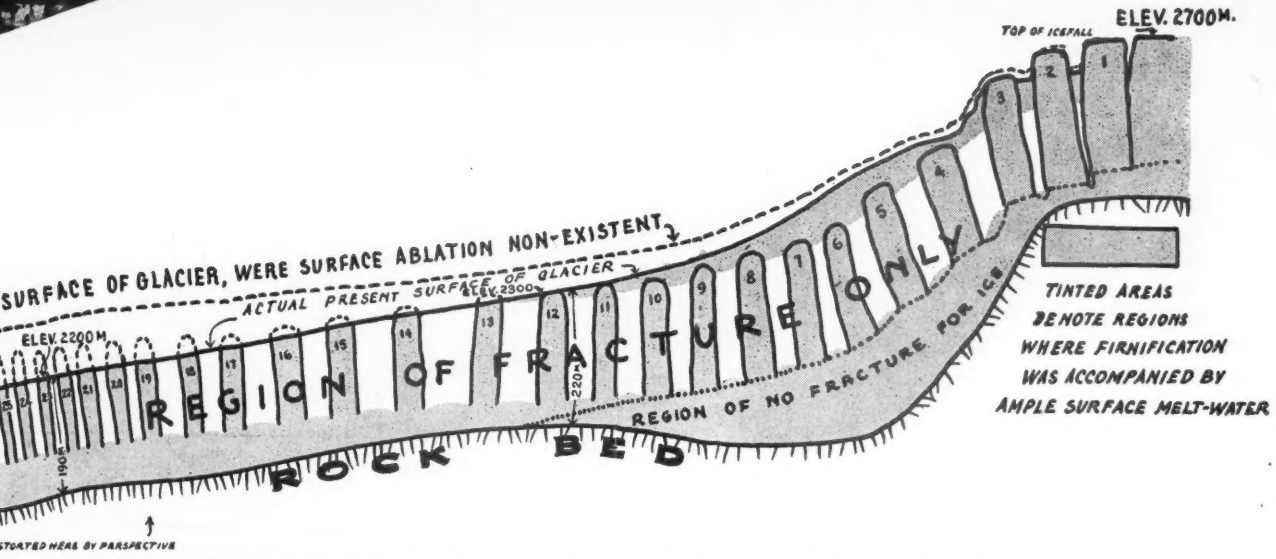
## *from the Dent du Requin, July 14, 1950*

To the right, the same view, shown as a theoretical profile, with cross-sections.

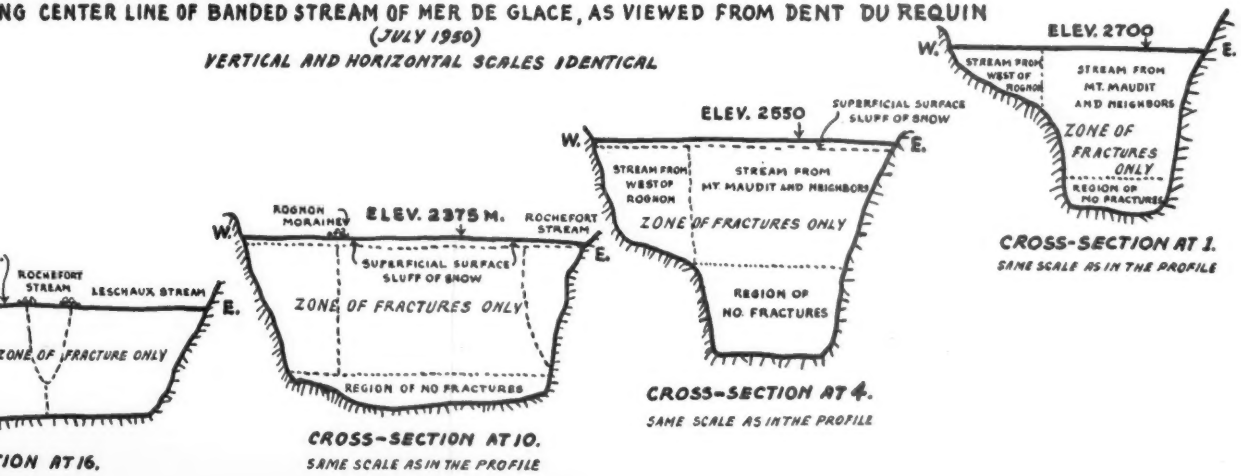





ELEV. 2700M.
TOP OF ICEFALL
SURFACE OF GLACIER, WERE SURFACE ABLATION NON-EXISTENT
ACTUAL PRESENT SURFACE OF GLACIER
ELEV. 2300
ELEV. 2200 M
REGION OF FRACTURE ONLY
REGION OF NO FRACTURE FOR ICE
ROCK BED
TINTED AREAS DENOTE REGIONS WHERE FIRNIFICATION WAS ACCOMPANIED BY AMPLE SURFACE MELT-WATER
STORTED HERE BY PARSPECTIVE

NG CENTER LINE OF BANDED STREAM OF MER DE GLACE, AS VIEWED FROM DENT DU REQUIN
(JULY 1930)
VERTICAL AND HORIZONTAL SCALES IDENTICAL



further insight into the method of formation of Forbes dirt bands. Small piles of glass beads were deposited on the surface of the ice in a row 150 meters long, immediately above the icefall on the plateau of the Glacier du Géant, in a longitudinal direction. The piles of beads were five meters apart, and each pile contained about one tablespoonful of very small, brilliantly colored glass beads—scarlet, purple, navy blue, yellow, etc.—which could not be confused with duller-colored native minerals. Referring to the profile of the Mer de Glace icefall (Fig. 2), this line of beads ran, in 1946, down-glacier from the point marked *"Elev 2700 M.,"* off to the left. The idea is to check the spacing of these piles after some 20 years, when the entire line will have moved on down below the icefall, and should begin to reappear on top of finger 13 in Figure 2. (Finger 13 may be identified in Fig. 1 as the first vague indication of a true Forbes dirt band.) It seemed nevertheless to be worth reexamining the bands and the icefall of the Mer de Glace in the summer of 1950 in the light of other observations made under the auspices of the American Alpine Club Research Fund in the summer of 1948.

These 1948 observations were made on a lane of uniquely white bubbly ice among several lanes of normal clear ice on the Gornergletscher, above Zermatt.[2] (See Fig. 3.) In brief, the ice of that white lane was found to be permeated with air bubbles to such a degree that its density measured only 0.82 in contrast to that of the clear ice on either side, which was 0.91. The remarkable whiteness of the bubbly ice is due to two factors: first, the snow-like optical qualities; second, the lack of dirt on the surface, because the rock and dust particles melt themselves about ten centimeters into the ice, concealing themselves from any line of sight not in the axis of the tiny holes above them. In the light of this finding, there was particular interest in reexamining the Mer de Glace to find out whether the ice in the white bands was similar to that in the white lane of the Gornergletscher.

This was found to be the case. Facilities for measuring the relative densities of clear normal ice and white bubbly ice were not at hand last summer; but Figure 4 shows specimens of normal and

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[2] Joel E. Fisher, "Ice Pyramids on Glaciers," *Journal of Glaciology*, I (1950), 373-7.

bubbly ice from a typical pair of bands side by side—normal darker ice at the right and white bubbly ice at the left. As the density of clear glacier ice is 0.91 and as that of the extremely bubbly ice of the white lane on the Gornergletscher was 0.82, it is the writer's opinion that this bubbly ice of the Mer de Glace has an intermediate density of about 0.85. Figures 5 and 6 show close-ups of the surface of the same pair of bands on the Mer de Glace from which the specimens of Figure 4 were cut. Figure 5 shows clearly how surface dirt bores its little dust wells into the surface of bubbly ice. Bottoms of these holes, with dirt visible, can be seen only when they are directly under the observer's eye; at any angle, even slight, the eye sees only clean ice. Figure 6, on the other hand, shows how dirt remains on the surface of normal ice. Figures 5 and 6 were taken within three minutes of each other, so that there is no need to allow for the surface of ice having changed by ablation between the two photographs. The observations recorded in Figures 4, 5 and 6 were made at fingers 34 and 35 in the profile (Fig. 2).

The writer had previously concluded that bubbly ice névé develops only where firnification takes place with a minimum of melt water present, characteristically, under conditions of exceptional cold. For example, the white lane of the Gornergletscher was traced by the writer, in July 1950, back to its origin. Its area of accumulation was found to be a full square kilometer of snow fields high up against the Silbersattel of Monte Rosa, at an elevation of 4200 to 4500 meters with a northern exposure. Monte Rosa is well-known as a cold mountain; and this area of accumulation—the only area of such size, at such an altitude, in the Alps—more closely simulates true high arctic conditions than any other in the Alps, and therefore is likely to be conducive to such bubbly ice formation.[3] Bubbly ice is reported as common, sometimes omnipresent, in high arctic glaciers.[4]

It remains to deduce what peculiar mechanism could introduce into this Mer de Glace, every year, a vertical cross-glacier dike of ice, firnified under dry cold conditions, without melt water—conditions directly opposite to those controlling the firnification of its

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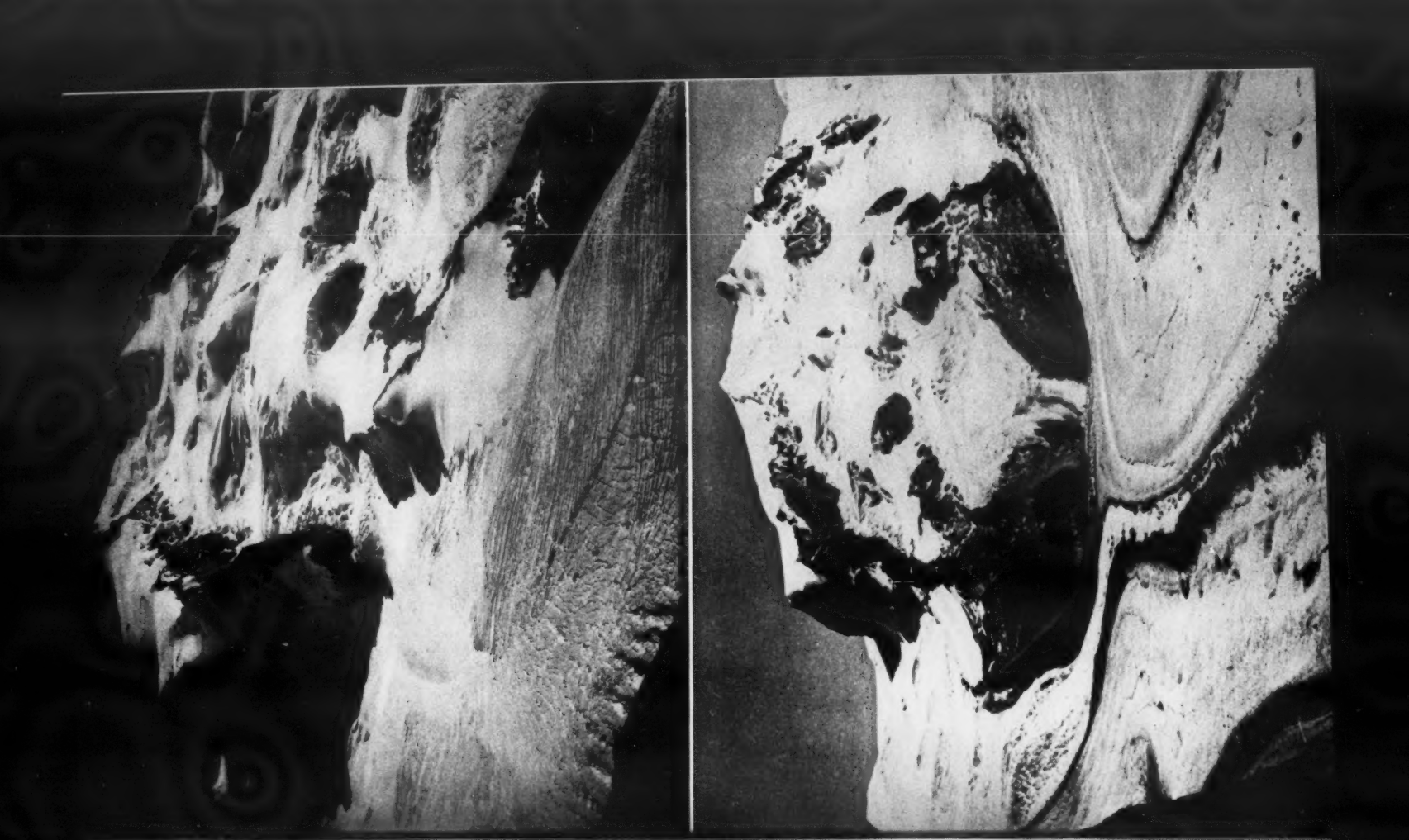
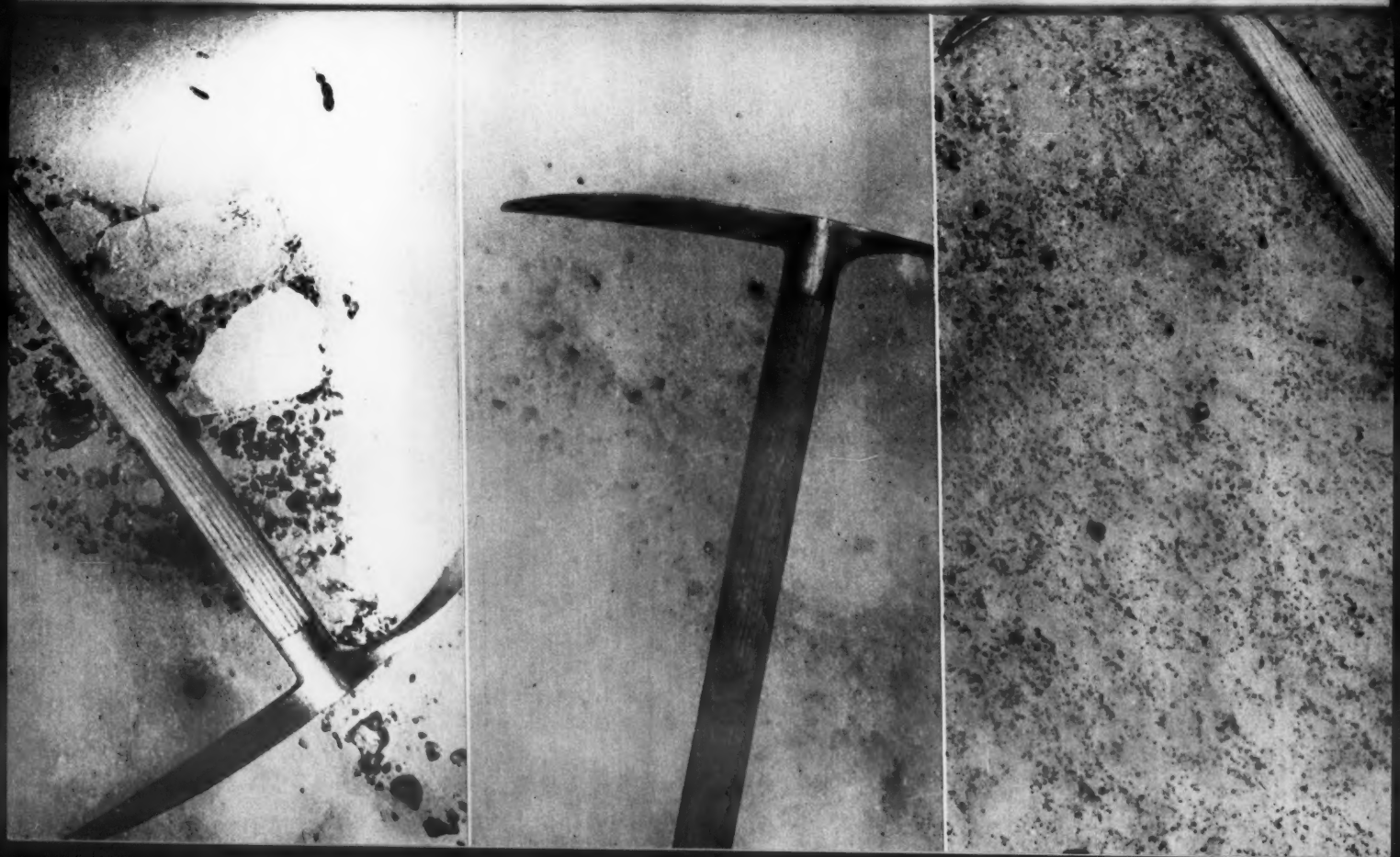
[3] Henri Bader, "The Significance of Air Bubbles in Glacier Ice," *Journal of Glaciology*, I (1950), 443-51.

[4] E. V. Drygalski and Fritz Machatschek, *Enzyklopädie der Erdkunde und Gletscherkunde* (Vienna, 1942), p. 74.





adjoining side walls of normal clear ice. It is clear that these broad bubbly ice bands must extend down below the surface at least as far as the amount of surface ice to be removed later by surface ablation during the years of flow to the snout. This period is counted by the number of white bands, each representing a year's flow, between the foot of the icefall (finger 13) and the snout of the glacier, some 50 bands beyond the left edge of Figure 2—75 bands in all. Additional evidence that these bands provide an accurate count of a year's flow is supplied by the movement of an enormous erratic boulder which the writer observed and photographed in 1912, located then at finger 9 in Figure 2. In 1950 this boulder had moved down to what would be finger 47—38 bands in 38 years. Its size so far exceeds that of any other on this glacier as to require no identification beyond a comparison of photographs taken in 1912 and 1950.

The basic mechanism leading to the formation of these white ice dikes was described in 1949 as the origin of Forbes dirt bands.[5] It was described how a glacier, on riding out over the rim of a step in its bed, cascading down that step as an icefall, will be broken off by ***regular annual glacier-wide*** crevasses at the top of the fall, if the edge of the step is straight, if the volume of the glacier is sufficient and if its velocity is within prescribed limits. Each winter's cold wave, penetrating the upper part of the ice, appears to strengthen the cantilever-like behavior of that ice as it is projected over the step. Cold thus defers the formation of the crevasses to the summer season. The yearly formation of a crevasse stretching right across the glacier results in the formation of glacier-wide strips or islands of unbroken ice across the icefall. (See Fig. 1.) If there is a sufficient cushion of flowable ice which does not fracture under the islands, they will ride more or less intact down the icefall. (See Fig. 2.) Otherwise, they will be completely broken up.

Consider now the great annual crevasse at the top of the icefall. Hardly has one season's annual crevasse opened before ice debris breaks off from its brittle side walls to begin to fill it up. Drifting winter snow will complete the back-filling of any such crevasse. As the glacier moves down the icefall, within two or three years,

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[5] Joel E. Fisher, "American Alpine Club Research Fund: 13. Dirt Bands," *A.A.J.*, VII (Sept. 1949), 309-17.

ice debris from above begins to smother the surface of the whole slope, covering ice islands and crevasses alike under one great smooth blanket. This shows well in the photograph (Fig. 1) and is marked in the profile (Fig. 2) as the tinted area at the surface between fingers 4 and 11. For several years this blanket of debris hides the structure of alternate crevasses and ice islands, developed at the start of the icefall.

Is it possible to deduce what will become of the snow and debris filling the annual crevasses as they flow down the glacier? First, we must remember that, before the crevasses formed, the ice was everywhere at the *pressure melting point.* But as soon as the ice opens in a crevasse, the ice in the wall of the crevasse, having no pressure on one side, is no longer at but *below* pressure melting point; so that the snow filling the crevasse must firnify in a sort of "deep freeze." The snow itself, accumulating in winter, will be well below its melting point, and free of melt water. These are just the conditions which have been found to lead to the formation of bubbly ice. The excessive friability of ice would lead to a far wider zone of brecciated, pulverized ice on each side of each wide crevasse than would be expected in rock faulting, so accounting for the breadth of resulting bubbly ice.

In each crevasse firnification of the back-fill proceeds with no water present, except for a thin superficial top layer into which summer melt water may percolate. As soon as the density of the ice reaches about 0.8, interconnecting passages between entrapped air will be sealed off.[6] By then, probably about the fourth year, this inlay is proof against all surface water seepage. After about 12 years, when the previously mentioned surface scruff of accumulation has been carried away by ablation, and, even further, when ablation has etched deeper to remove all the upper part of each back-filling that did experience some melt water during firnification (at about the position of finger 13), the true bubbly ice will begin to be exposed at the surface, to appear as dikes of white ice between intervening walls of darker normal ice.

In Figure 2 the profile has been drawn to show diagrammatically that crevasses extend down to a depth of some 200 meters.

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[6] G. Seligman and M. F. Perutz, *Proceedings of the Royal Society,* A, CLXXII (1939), 335-60; Bader, *op. cit.,* p. 445.

By this it is not necessarily meant that great gaping crevasses will remain open indefinitely at that depth. It is generally considered that crevasses will not stay open at depths greater than 50 meters; but cracks may extend down to 200 meters. Soft powder snow, pressing down into any such incipient downward extension of a crack, will fill it faster than it could close by slow sideways flow of ice. At depths greater than 200 meters, it is assumed that the hydrostatic pressure is enough to prevent any fracture whatever from forming: this is the region of true flow of ice (Fig. 2: dotted line). It is a layer of sufficient depth to produce, by reason of its depth and its flowability, a soft cushion on which the glacier-wide islands of ice may float down the icefall more or less intact. Such a cushion is undoubtedly one of the several prerequisites for the formation of Forbes bands.

It may be added that 200 meters is estimated to be the thickness of material removed by surface ablation over the entire life of the bands of the Mer de Glace, and it must therefore be that this bubbly ice finds opportunity to form at least that far below the surface in the icefall. If less than 200 meters of surface ice is removed by later surface ablation on the lower glacier, then a lesser depth through which bubbly ice might form would be sufficient. There appears to be no glacier of sufficient length, possessing Forbes bands, on which this can be tested.

These Forbes bands may then be considered to develop where there is a prescribed balance between volume, velocity of flow down an icefall, sufficient thickness of ice, and a sufficient seasonal variation in temperature across the freezing point. Such factors, interplaying with the principles of pressure melting points of ice or snow, produce, as described above, a sequence of dikes of bubbly ice, sandwiched, cross-glacier, between walls of normal ice.

The studies in 1950 did not deal explicitly with the origin of so-called Alaskan-type bands. They provided evidence, however, that a similar mechanism is at work: a seasonal stratification of snow, firnified under seasonally different amounts of melt water, results in horizontal laminations of alternately bubbly and normal ice. During extrusion flow these laminations are rotated and eventually appear as near-vertical dikes of white and dark ice lower down, resembling true Forbes bands so nearly as to be almost indistinguishable.

# Discoveries in Alaska (1896)

W. A. Dickey

[*The following article, made available to us by Bradford Washburn, appeared in* The Sun *on Sunday, 24 January 1897. The headlines under the title read: "The Unknown Region North of Cooks Inlet Entered / Explorers find a Flat Country where the Government Maps show the Southern Part of the Alaskan Mountains / A mountain revealed which is believed to be 20,000 feet high. If so, it is the loftiest summit of this continent / Good Geographical work by Prospectors."—Ed.*]

THE largest unexplored region in the United States is the district north of Cooks Inlet, Alaska. The Kuskokwim and Nushaguk flowing into Behring Sea, the Tanana into the Yukon, the Sushitna into Cooks Inlet, and the Copper River into the Gulf of Alaska drain this "terra incognita." They are all large, muddy rivers, draining great glaciers, and are at flood height throughout the short summer season. The difficulty of making headway against such swift streams, the clouds of gnats and mosquitoes, the reputed fierceness of the interior Indians (the Apaches of the North) have all served to keep out both the explorer and that most venturesome of all investigators, the prospector.

The discovery of paying placer mines on Cooks Inlet in the fall of 1895 brought about 2000 prospectors to its shores last summer. They swarmed over Kenai Peninsula, staking out claims in the deep snow, and the surplus ventured into the Kiuk and Sushitna valleys, both unexplored districts. Over one hundred parties entered the Sushitna River, but only five attained any great distance up the river. One party provisioned for two years proclaimed that they were prepared to ascend the Sushitna to its source, and if they found nothing there they would go on to the Tanana; if still unsuccessful, they would keep on northward to the Arctic Ocean. In five days they were on their way back, saying they thought there must be some easier way to the North Pole. Another party gave up the attempt after nearly losing their lives, their boat, driven by the swift current, jerking them off the bank from which they were towing. One young man from Boston turned back after he and his mate

had been about a week on the river without reaching the station, giving as a reason his unwillingness to prospect a country where he was obliged to tie up his head in a gunny sack every night in order to escape the mosquitoes.

We landed at Tyonick, near the head of Cooks Inlet, the first week in May, 1896, in about two feet of snow, thick blocks of ice lining the shores, and awaited the opening of the Sushitna. Our object in prospecting the Sushitna was the hope of finding placer mines on its upper waters. There were several reasons leading to this conclusion. One of the most important was that anywhere on the shores of Cooks Inlet a few colors of fine gold could be found. Probably this gold came from the largest stream entering the inlet; then the Copper River, rising in the same district, was reputed to be rich in gold and copper.

Cooks Inlet is like the Bay of Fundy. It is shallow, with high, swift tides, the extreme being about sixty-five feet. It is often visited by violent storms, so violent that the natives pack many miles along its beach rather than venture out in boats.

Starting in an open dory, with the incoming tide, we reached the broad mud flats extending some fifteen miles from the mouths of the Sushitna. All night and a greater portion of the next day we spent on the flats hunting for the entrance of the river, for the Sushitna, like many Arctic rivers, has quite an extensive delta, which, with its network of channels, is eight or ten miles wide. Inside the entrance, the swift current, low, muddy, and caving banks, covered with thick brush and cottonwood trees, render progress very difficult. On all sides are the traces of great floods, the entire country for miles being subject to overflow. Many unable with oars to stem the mighty flood have given up the struggle before reaching the trading post thirty miles above tidewater on the river.

The river at the station has two channels: the eastern as measured on the ice is 855 yards wide, and flows swift and deep from shore to shore; the other channel is nearly as large, but not so swift and deep. Just above are the first high banks, perpendicular promontories of rock on each side, against which the stream rushes with great force. Whirlpools in the current seemed to threaten to engulf our boat, but as suddenly as they form they disappear, and we crossed in safety. Finding our sea dory too heavy to handle,

we stopped at the station long enough to whipsaw lumber and make two river boats, such as are used on the Yukon, 25 feet in length over all, 18 inches wide on the bottom, and 40 inches at the top. Not having any tar, we pitched the seams with spruce gum and grease. Our equipment consisted of paddles, poles, and tow lines.

While building the boats we witnessed the annual run of candle fish, a species of smelt so fat that when dried they will burn like a candle. The natives stand on the bank with rude dips made of willow roots and catch quantities of them, which are dried on long racks in the sun. Indeed, the river was so full of the fish that it was impossible to dip a bucket of water without catching some of the little beauties. The lean Eskimo dogs put on a layer of fat during candle fish season. They stand on the bank and expertly paw the fish out of the water.

A short distance above the station a great branch comes in from the west. The Indians say that this branch runs around the head of Cooks Inlet and rises in a high range of mountains which we had seen from Tyonick. Above this fork the river again spreads out into many channels, so that it is difficult to tell where to go, the low banks affording no clue as to the probable main course of the river. Twenty miles further another large branch comes in from the west, the main river bearing almost due north. For two weeks we travelled amid islands and sloughs, the river at times several miles wide across its many channels.

On the east were the mountains that form the watershed between the Knik and Sushitna valleys, a low but rugged range from 3000 to 6000 feet in altitude. From these mountains several small rivers flow into the Sushitna, but they did not prospect as well as the main stream, which gave us from six to 200 colors per pan, it being almost impossible to get a pan which did not have some colors.

Several days of heavy rain, which carried off the snow still reaching almost to the river's banks, raised the stream to flood height, and further progress was for the time being impossible. The driftwood ran in a continuous stream, and the river rose until we had to move our camp. It seemed as though the whole country was to be submerged, when, as suddenly as the rise, the river commenced to fall, and after a week's delay we resumed our trip on the swollen stream. The first day we made only two miles, though

we worked desperately hard, a part of the time in the icy water up to our waists, crossing and recrossing the channels. We were even obliged to unload our boats, take them out of the water, and carry them overland across islands to avoid places where great jams of driftwood, acting as wing dams, rendered the channels we were in impassable. The river here was full of cottonwood snags, around which the current rushes in great swirls, very dangerous to a boat. Where we could, we waded and towed our boats, relying on our quickness to cross safely the treacherous quicksands into which we frequently sank to our knees; at one place we actually lost one of our long poles, which was held so firmly in the quicksand that we could not pull it out.

The mosquitoes hung in clouds about us, compelling the constant use of veils and gloves. Even the Indians on this river wear cheese cloth veils over their faces. At night we pitched our tents low, sewed the entrance up tight, pulling the sides and ends under a canvas flooring on which we made our beds. Each of us taking a corner of the tent, we could kill off the mosquitoes that had come in with us as we crawled under the flap, and then sleep in peace. Luckily in June the days are so long that it is never too dark to see to kill mosquitoes.

On the clearing up of the weather we obtained our first good view of the great mountain, occasional glimpses of which we had had before, the first from near Tyonick, where we saw its cloud-like summit over Sushitna Mountain. This mountain is far in the interior from Cooks Inlet, and almost due north of Tyonick. All the Indians of Cooks Inlet call it the "Bulshoe" Mountain, which is their word for anything very large. As it now appeared to us, its huge peak towering far above the high, rugged range encircling its base, it compelled our unbounded admiration. On Cooks Inlet we had seen Iliamna's still smoking summit, 12,066 feet above us, rising precipitously from the salt water. Inland is a continuation of the same range, and even higher, probably 14,000 to 15,000 feet in altitude. On Puget Sound for years we had been admirers of Mount Rainier, over 14,000 feet high, but never before had we seen anything to compare with this mountain. My companion in the boat, Mr. Monks, was one of the few who made the ascent of Rainier the previous summer. In his opinion Rainier was about the same altitude as the range this side of the huge peak, which tow-

ered at least 6000 feet above its neighbors. For days we had glorious views of this mountain range, many of whose glaciers emptied apparently into our river.

July 4 was ushered in with a heavy rain. While we were encamped waiting for the storm to pass over, a great rumbling proclaimed the approach of an earthquake, which was very violent and of considerable duration. This, the second violent earthquake since our arrival in this country, the high volcanoes still active, the great tides, the huge mountains covered with glaciers, impressed us that here man must indeed battle with nature. In fact, this whole country seems new, unfinished, unfit for the habitation of man. Few and scattered are the Indians who have the hardihood to withstand the severe winters and the many pests that make the short summer season almost unbearable.

According to our journal, 100 miles above the trading station, the river again forked, this time into three branches. The branch from the northwest apparently drains the southern slope of the great range, and like a flowing sea of mud spreads out in many channels about two miles wide. The branch from the northeast is as white as milk, while the middle stream, which we concluded was the main river, was nearly clear. This last river had good towing banks, and but few channels, and we soon entered a narrow valley almost a canon, between the mountains, which now enclosed us on both sides. Ascending one of the highest of these that stood out into the valley, we had a splendid view of the river valley below, and solved a question which had previously given us much study, namely, why such large branches came in from the west, where the Government chart of Alaska shows a great range of mountains.

The fact is, there is no range there, but a broad, flat valley extended westward as far as the eye could reach, heavily timbered with spruce and birch. It is apparently a continuation of the flat country that surrounds the upper portion of Cooks Inlet. I should estimate the dimensions of this valley as being nearly 100 miles each way. In the south, Mount Sushitna, some 5000 or 6000 feet high, marked the mouth of the river. In the east was the rugged but low range that separated us from the Kiuk Valley. In the northeast was an apparent gap in the range, through which our river ran, and whose course we could trace for thirty or forty miles.

In the northwest was the greatest range of mountains we had ever seen, of which the great mountain previously mentioned was the culminating point.

We were amazed at the fine growth of grass, which in the short time since the snow had been gone, had attained a height of nearly four feet. In any open glade one could make most excellent hay. It is hard to understand why, with such fine feed in a country so sparsely inhabited, there are no more moose and reindeer. Perhaps it is due to the rigorous climate and the abundance of fierce timber wolves and a large brown bear as large and dangerous as the Rocky Mountain grizzly.

The river now had many boulders and rapids. On one side we passed a high bank in which were seams of coal of fair quality, eight or ten feet thick, to which a steamer could extend its gangplank and get a load with pick and wheelbarrow. After passing this coal formation the river entered a long series of canons with slate walls. Back of these, some seven or eight miles, were low granite mountains. Some of this granite is a rich green, the most beautiful I have ever seen. About seventy miles from the great forks we came to a small village of the Kuilchau, or Copper River Indians, tall and fine looking, and great hunters. Throughout the long and arduous winter they camp on the trail of the caribou. They build huge fires of logs, then erect a reflector of skins back from the fire, between which reflector and the fire they sleep, practically out of doors, although the temperature reaches 50° below zero. We were surprised to find them outfitted with cooking stoves, planes, saws, axes, knives, sleds sixteen feet in length, 1894 model rifles, etc. They were encamped near a fish trap which they had constructed across a small side stream, and were catching and drying red salmon. They had no permanent houses, living in Russian tents, with the entrance arranged like our own to keep out the gnats and mosquitoes. They informed us that we could go no further with our boats, as the Sushitna now entered an impassable canon, whose upper end was blocked by a high waterfall. "Bulshoe!" they exclaimed, raising both hands high above their heads.

As the small side river on which they had their traps prospected well, we followed it for some distance, until it ran into a canon, where further progress was impossible without a long and hard detour over a mountain side.

One of the Indians undertook to show us the portage around the falls on the main river, but finding the path very steep and difficult, dangerous even to carry our packs, we gave up the attempt without seeing the falls, which must be very high, from the appearance of the canon and surrounding country.

The river at the highest point we reached was about 200 yards across, deep from shore to shore, with a millrace current. From the maps which the Indians made for us of the continuation of the river above the falls, we inferred that it ran a long distance to the northeast, probably from 150 to 200 miles, though none of the natives had been to its source. The Kuilchaus, who trade at the Kiuk station of the Alaska Commercial Company, say that some of the tribes live on a lake that empties into the headwaters of Copper River, and the balance on a lake not far distant, in which the Sushitna rises, and that it is only a short portage from either lake into the Tanana.

At all events, from the size of the Sushitna at the falls and from its direction it must flow nearly from the Copper River. Other prospectors who ascended the muddy western branch informed us that about forty miles from the great forks it branched, one stream flowing northward around the base of the great range from whose many glaciers it receives several tributaries: the other, flowing west, drains the southern side of the great range, finally turning back into the flat valley that runs a long way to the west. From a mountain top they could trace its course in the flat country for many miles. To the north they could see a stream apparently flowing west, which they thought was the Kuskokwim. One glacier at the forks came down almost to the river's bank and was the source of a large stream. They could trace the glacier far back toward the great mountain.

Unable to pass the falls on the main river we turned down the stream to the great forks. It was very exciting and dangerous running the rapids among the big boulders, the race-horse speed at which we travelled giving us no time to examine the river ahead. The boiling waves several times entered our boats, and we were constantly on the jump to keep them from swamping. We could make a greater distance down the stream in an hour than we could up in a day.

We ascended the western branch nearly to the canon, where

we met a party of prospectors coming down. Their boat, which they were towing, had been dragged by the swift current under a snag and upset, and they lost all their outfit. They reported the canon ahead impassable, owing to the high water in the river. Two weeks of almost continual rain raised all the river to flood height. Our provisions being low, and one of the party being sick, we reluctantly turned back to the station, which we reached in two days. We ascended Mount Sushitna near the mouth of the river and confirmed our previous observations on the upper river, namely, the extent of the broad, flat country, and the total absence of the great Alaska range as marked on the Government charts of Alaska.

We named our great peak Mount McKinley, after William McKinley of Ohio, who had been nominated for the Presidency, and that fact was the first news we received on our way out of that wonderful wilderness. We have no doubt that this peak is the highest in North America, and estimate that it is over 20,000 feet high. We have talked with seven different parties who saw the mountain this summer, and they estimate its height at over 20,000 feet. Most of them think it is nearly 25,000 feet in altitude. Our last view of its towering summit was from one of the tideland islands at the mouth of the Sushitna. Here on a glorious evening we had a fine view of Iliamna, 100 miles south, and Mount McKinley, to the north. Field glasses brought out the details on Iliamna, but made no change in the appearance of Mount McKinley, which was nearly twice the distance away. Notwithstanding its greater distance, Mount McKinley looked much the higher of the two peaks.

Much interested in the geography of this country, and finding the Government charts so unreliable, we gathered all the information possible from the Indians and the few whites who had, during the summer, prospected on the upper river. The Kuilchaus drew for me a map of the river, holding the pencil by the extreme end, and much amused with their first experience with pencils and paper. When they reached as far in the drawing as they had ever been on the river, they drew their pencil around back and shook their heads, and we could not get them to venture any further opinion as to the river beyond. Their only way of estimating distances was by sleeps, as they had no conception of what a mile was; in fact, they did not know what the words Indian or white signified.

One of the Kiuk tribe, an intelligent and prosperous Indian who

trades with the interior Indians and who travels every winter in the interior country, drew a map showing the relation of the upper Copper, Sushitna and Tanana rivers. He makes, as do all the interior Indians, the three rivers in close proximity at their head waters.

We found colors of fine gold in nearly every pan, and on the upper river platinum. The formation for the last forty miles below the falls was slate porphyry and granite, many veins of white quartz running through the slate. One specimen assaying well in silver, copper and gold would be very valuable were it nearer means of transportation or in a less rigorous climate.

The natives on Cooks Inlet are devout Greek Catholics. Every village has its church and even the Copper River Indians fear the priests. Last winter some of the Copper River Indians who came down to trade at the Kiuk station had several wives. This the Greek priest said was wrong, and ordered them to put away all but the woman they had married first. Too superstitious to refuse, the Indians sent their extra wives away, but on the departure of the priest for other parishes the banished wives, who had only retired a short distance, promptly returned to their former lords.

Many Indians were killed or seriously wounded by the great brown bear, which they hold in great respect. They never bring in the head or claws, although they would bring higher prices at the store with them left on the skin. At Kuskutan last spring a hunter did not return to the village after his daily trips of inspection to his traps. The next morning another brave, axe in hand, went to search for him. He also failed to return, and the next day the whole village went in search of the missing. They found nothing except the axe and huge bear tracks. A few days later an enormous bear chased some of the natives to their very doors, notwithstanding the many wounds inflicted by the rifles of the pursued. After that he hung about the village, and although shot many times he would soon return. Just after dark one evening he suddenly appeared at a window at one of the cabins, smashed in the glass, and gave the lamp standing inside a knock that sent it across the room. Without further ceremony the monster proceeded to climb into the room. Luckily all escaped through the door, and the men finally drove the bear away with no further damage than the wrecking of the furniture. All were now afraid, for surely this must be an evil

spirit or shaman and not an ordinary bear, as bullets seemed to have no effect on him. As a last resort they took some bullets to the church, had special prayers recited and holy water sprinkled over them; then they marched three times around the church, carrying the sacred candles and praying for deliverance from the shaman. The next time the bear appeared one of the holy bullets found a mortal spot, and the huge bear came crashing to the earth. "God killed the bear and not our bullets," cried the old chief who told us the story, as he reverently stood with hands uplifted. I counted thirty-two bullet holes in the hide which he showed us; one hole in the head undoubtedly did the work.

Some idea of the remoteness of Cooks Inlet can be gained by the fact that it was more than seven weeks from the time we commenced our homeward voyage before we finally reached Seattle, much benefited by our summer's outing in unexplored Alaska.

# PROCEEDINGS OF THE CLUB

## Secretary's Annual Report

**Year 1950 (3 December 1949 to 2 December 1950)**

THE Club's activities have been in full swing during the past year. Since the last Annual Meeting in Philadelphia, meetings of the Directors have been held on March 18th in New York, on June 10th in New York, on October 7th in Barre, Massachusetts, and on December 2nd in New York. In addition, there have been numerous meetings of the various Council, Standing and Special Committees. Under the guidance of Miss Corning, Chairman of the Entertainment Committee, informal meetings for members and their guests have been held at the Club House about every month. These have served the purpose of giving Easterners a chance to meet our more distant members, whose visits to New York have often been made the occasions for such meetings.

During the year the Club lost by death five Active Members, namely, Lawrence Coolidge, Dean Langmuir, Joseph N. Le Conte, Harvey Bassler and Anthony Fiala, and three Honorary Members, namely, Sydney Spencer, Field Marshal the Rt. Hon. J. C. Smuts and Henry L. Stimson. New members were elected as follows: nine in February, 21 in April, five in August and eight in November. Hence, not counting the applicants passed at the meeting of the Council on 2 December 1950, the membership shows a gain during the year of 38 Active Members. Our present membership is 387 Active Members and ten Honorary Members, of whom five are also Active Members, making a total of 392.

On the West Coast the Sierra Nevada Section and the Cascade Section have been active. The minutes of their official meetings, which their officers have been kind enough to send me, and which are kept with the Secretary's records, show their active interest in every mountaineering problem that arises in their areas.

It is a pleasure to report that the Club's direct activity in mountaineering research will be increased shortly by its finally taking over the excellent program carried on during the past years by the American Alpine Club Research Fund. Pursuant to the unanimous recommendation of the Trustees of the Research Fund, the Club's

Directors have voted to have a Research Committee of the Club take over this work. A formal resolution will be submitted to the Club's members at the next Club meeting. Since this step requires advance notice to members, in writing, it can not be legally voted upon at the 1950 Annual Meeting.

Another step forward in the Club's program was the first issue, during the fall, under Miss Gest's guidance, of *American Alpine Club News*. This has been received with such enthusiasm that it is hoped to make it a regular part of the Club's activities. Knowing that you have all carefully read this excellent news sheet, I will avoid repetition and omit from my report the customary brief outline of members' mountaineering achievements during the year.

BRADLEY B. GILMAN,
*Secretary*

## Annual Meeting and Dinner

The 48th Annual Meeting of the American Alpine Club was held in the Club House, 113 East 90th Street, New York City, on Saturday, 2 December 1950, at 2.00 P.M.

President Hall called the meeting to order at 2.15 P.M. He stated that the business meeting was restricted to members, but that guests would be welcomed upstairs in the Library during the meeting. More than 50 members were present.

President Hall first reported the receipt, as a gift to the Club from Belmore Browne, of the 1910 United States flag, with 46 stars, which was carried by that famous mountaineer on his McKinley climbs.

The President then called for the Minutes of the 1949 Annual Meeting; but, on motion duly made and seconded, the reading of the Minutes was dispensed with, and the Minutes were accepted and filed.

The President requested Messrs. Fisher, Wood and Cook to act as tellers to count proxies. Mr. Fisher asked to be relieved of this duty, because he wished to speak from the floor on some of the proposals. Messrs. Wood and Cook accepted and retired tempo-

rarily to prepare an exact account of the proxies which had been received.

The Secretary then read his Annual Report, acceptance of which was duly voted. Printed copies of the Treasurer's Annual Report were distributed, and the Report summarized by Mr. Measuroll. After discussion of several items, it was, on motion duly made and seconded,

VOTED: To accept the Treasurer's Report and to approve all transactions by Club officers relating to cash, real estate and securities referred to in said Report and to approve all negotiations conducted in the name of the Club by the Treasurer during the past year.

Mr. Field reported for the House Committee that it had worked pleasantly with the Entertainment Committee, that the Club House had been kept in good condition in spite of severe difficulty in keeping the contents clean, and that the Committee had in mind use of the rear building, if practical. In closing, he called attention to Dr. Thorington's exhibits in the showcases. The Report was accepted and placed on file.

Miss Corning reported for the Entertainment Committee, telling of monthly meetings at the Club House with average attendance of 60, steadily increasing. She stated that the collections at the meetings had just permitted the Committee to cover costs. She spoke of interesting programs scheduled for December, January and February. Her Report was accepted with acclamation.

The Conservation Committee had no matters to report.

Mr. Bates, for the *Journal* Editors, reported that one issue is in prospect for 1951, with accounts of the outstanding expeditions of 1950. Mrs. Orcutt commented on the desirability of distribution of the *Journal* in spring rather than in summer. Mr. Henderson urged more complete coverage of American climbing in the Various Notes. The President suggested that members might assist the Editors by sending them newspaper clippings and reports of any mountaineering events in their own localities. Mr. Robertson stated that the Editors would welcome aid of this sort.

Mr. Miller reported for the Safety Committee, commenting on the fact that the 1950 Report had been prepared by the offset process rather than by more expensive printing methods. He stated that mountaineering acidents seem to be diminishing, and that the use

of safety techniques is becoming more widespread. He suggested the possibility that the Club might make an annual award of a plaque to the U.S. mountaineering organization most active in promoting safety. Mr. Henderson suggested renewed emphasis on the Club's policy of disseminating information about correct danger signals, and increased distribution of posters and cards bearing on this point. Mr. Fisher reported that 2000 unused cards describing proper danger signals had been sent some months ago to the National Park Service. Mr. Bonney suggested that the Club might well consider preparing a statement of safety rules for the education of young climbers. Mr. Miller commented on the fact that the Alpine Club of Canada had voiced an interest in the production of a North American manual pointing out safety measures. The President remarked on the activity of Club members in Seattle in well-organized rescue parties, and pointed out that similar steps were being taken in California and Colorado. Mr. Craig stated his belief that the Club could be effective in integrating safety programs of different groups and could secure Government cooperation in this line of endeavor.

Miss Buck stated that her Librarian's Report had already been mailed to all members. She emphasized that the Club House would be open from 10.00 A.M. to 5.00 P.M. on Sunday, December 3rd, for the use of members and their guests.

The President requested the Secretary, in the absence of Dr. Howorth, Chairman of the Nominating Committee, to read that Committee's Report. This the Secretary did, reporting the nomination of Messrs. William R. Hainsworth, Walter A. Wood, Jr., and John C. Case to the Council for the three-year term from 1951 to 1953. The President stated that Mr. Leonard had submitted his resignation as Western Vice-President of the Club, and that the Council had, with regret, accepted it. The President asked for further nominations, but there were none. On motion duly made and seconded, it was

VOTED: To close the nominations and instruct the Secretary to cast one ballot for the slate reported by the Nominating Committee.

This was done, and the three nominees were declared elected.

The President stated that the next business was consideration

of the various proposals for amendment of the By-Laws. On motion duly made and seconded, it was

VOTED: That any proxies of persons present be cancelled so that members at the meeting would vote in person, and also that the time for acceptance of further proxies be considered as closed.

Mr. Fisher was recognized. He outlined the history, as he saw it, of two years' efforts to amend the By-Laws, culminating in today's vote, which, he believed, after a preliminary review of proxies, would show about 115 to 85 for the amendments, but would not show the two-thirds majority required for adoption of the amendments. Mr. Henderson asked about the Report of the Committee appointed a year ago to report on By-Law amendments. Mr. Bonney, Chairman of that Committee, stated what it had done and outlined in some detail several points that it had found particularly puzzling. On motion by Mr. Fuller, duly seconded, it was

VOTED: That comments by members on the proposals at issue be limited to three minutes each.

Mr. Cook stated that he held proxies for 27 members of the Sierra Nevada Section; that they had no dissatisfaction with the present Club management, but wished a right to vote; that, under the By-Law amendments suggested by Mr. Farquhar and endorsed by his Section, voting would be necessary only in the event of a real contest; and that, having received assurance that a special meeting would be called to let members vote on the Farquhar amendments or something very similar, he expected to cast his 28 votes against all except the first two proposals.

The President then called for a show of hands on Proposal 1, and the unanimous vote of all present in favor of the amendment was recorded by the Secretary. On Proposal 1 the official count of votes by proxy was 83 to 2 in favor of adoption.

The President then called for a show of hands on Proposal 2, and the unanimous vote of all present in favor of the amendment was recorded by the Secretary. On Proposal 2 the official count of votes by proxy was 80 to 5 in favor of adoption.

Ballots were then distributed on which members could vote on each proposal. A blank ballot follows and is incorporated in these Minutes:

| | YES | NO |
|---|---|---|
| 1. To adopt Council proposal I regarding dues. | | |
| 2. To adopt Council proposal II for reconsideration of membership applications after 5 objections. | | |
| 3. To adopt H-G-R-M-G proposal III to establish a Nominating Committee. | | |
| 4. To adopt Putnam-Fisher proposal I on filling vacancies. | | |
| 5. To adopt Putnam-Fisher proposal II on conduct of meetings. | | |
| 6. To adopt Putnam-Fisher proposal III on selection of Nominating Committee. | | |
| 7. To adopt Putnam-Fisher proposal IV on order of business at annual meetings. | | |
| 8. To adopt Putnam-Fisher proposal V for balloting on By-Law amendments. | | |

Dated:.....1950

Signed:.....

There followed further discussion about the remaining controversial amendments. Mr. Latady commented that the Club should reduce its paper work and devote itself to mountaineering problems. Mr. Putnam spoke for his proposals, urging that younger members be used in Club organizations. He stated that the continued urging of these proposals for change in the By-Laws evidenced discontent with present management, and that more matters should be handled by members serving on committees without the need of reporting back to the Council for approval before acting. After further lively discussion, in which many members participated, Mr. Landt moved that the proposed amendments be tabled and referred to a committee. This motion was seconded; but then, on request of Mr. Landt, without objection, it was withdrawn.

Mr. House then moved that a ballot be taken on Proposals 3 through 8. After a show of hands, the President declared a majority in favor of the motion and requested members to mark their ballots.

Mr. Case moved that, regardless of the outcome of the ballot, the President be directed to appoint a committee to study various proposals for By-Law amendments, including consideration of the question whether the entire membership should ballot on officers,

and to report to the Council before March 17th; and that the Council, after receipt of this Committee's Report, send out the findings of the Committee with any comments by the Council and with ballots to be voted at a special meeting of the membership not earlier than March 17th and not later than 2 June 1951. The motion was seconded, and it passed by a large majority.

The President then introduced Mr. Cook and requested him to speak about plans for a summer encampment. Mr. Cook stated that plans were only in a formative stage. He believed the camp would be placed in the Tetons during the first and second weeks of August 1951, with a central commissary similar to that used at Sierra Club Base Camps. Mr. House suggested that the membership be canvassed to see who may attend. Mr. Cook stated that his Committee expects to do this as soon as plans are more nearly complete. On motion by Mr. Fuller, duly seconded, a vote of thanks to Mr. Cook was passed, with applause. On inquiry by the President, about one-third of the members present expressed by a show of hands their interest in possible attendance at the proposed 1951 camp.

The President then called on Mr. Wood to report for the tellers on the official count of proxies and ballots. Mr. Wood reported that Proposals 1 and 2 had passed by well over the necessary two-thirds vote, but that Proposals 3 to 8, inclusive, had failed to receive two-thirds of the votes cast and therefore failed of adoption.[1]

On motion duly made and seconded, the Annual Meeting was adjourned at 5.00 P.M.

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After the close of the business meeting, guests were invited to come down from the Library; and the enlarged audience listened with enthusiasm to a talk by Arnold Wexler, with very fine colored

[1] Subsequent to adjournment of the meeting, the exact final figures were reported as follows:

| | | |
|---|---|---|
| Proposal 1: | Aye (proxies). 83; | Nay (proxies). 2 |
| Proposal 2: | Aye (proxies). 80; | Nay (proxies). 5 |
| Proposal 3: | Aye ..... 56; | Nay .....110 |
| Proposal 4: | Aye .....121; | Nay .....129 |
| Proposal 5: | Aye ..... 93; | Nay .....159 |
| Proposal 6: | Aye ..... 93; | Nay .....159 |
| Proposal 7: | Aye ..... 90; | Nay .....164 |
| Proposal 8: | Aye .....109; | Nay .....141 |

slides, on his climbs in the Windy Range of the Northern Selkirks.

At the close of Mr. Wexler's lecture, members dispersed for an hour or so before gathering with guests at the Cosmopolitan Club for the Annual Dinner. After dinner, Oscar A. Cook gave an illustrated account of the climbs made last summer by his party of eight in the Coast Range. They flew from Vancouver to Ghost Lake; made a number of fine new ascents, including two new routes on the summit tower of Mount Waddington and the ascent of the north face of Mount Munday; and then back-packed out across the Tellot Glacier down to Scimitar Creek and up the west branch of the Homathko to Bluff Lake. The fine colored slides gave a thrilling impression of this magnificent area.*

Graham Matthews, David Harrah and James Maxwell then told, with colored slides and colored films, of the expedition to Yerupajá in the Peruvian Andes. Matthews recounted the journey from Lima to Base Camp. Harrah and Maxwell told of the difficult, hazardous climb, and of their very narrow escape near the top.†

BRADLEY B. GILMAN,
*Secretary*

## Report of the Librarian

**1 December 1949 to 15 November 1950**

The last report of the Librarian in the 1950 *American Alpine Journal* mentioned the completion of a detailed descriptive inventory of the hundreds of items of Club property other than the books, slides and photographs. To preserve this record and that of the books in the Library, this inventory and the two accession books have been microfilmed and the films deposited in a safety deposit box. Hereafter, additional pages can be microfilmed at the end of each year, if so desired, thus keeping the records up to date.

The chief work of the Library Committee has been to formulate new Library rules. For some time the Committee has felt that there was a real need for more precise rules to supersede the "Library Circulating Privileges" of 1938. Accordingly, library regulations of other clubs were studied carefully, and last spring a revision

*See pp. 33-44, 193-4 above.—*Ed.*
†See pp. 22-32 above.—*Ed.*

was drafted and submitted to the Council for their approval and adoption, if satisfactory. The new rules were read and discussed at the Council meeting on 10 June 1950; and they were approved and adopted on that date. Copies of the revision were forwarded to all Club members and will be sent to future members upon election.

A Lending Library is now available. Since 1929 we have had such a Library, formed from the accumulation of duplicates. Owing to lack of space, however, these books had to be stored in cartons at various times. This Library has grown to a considerable size and now fills two cases which have been reserved for it. We hope many members will make use of their privilege to borrow these books.

Since December 1949, omitting the attendance at the five teas and six evening meetings, about 45 members and 100 non-members have visited the Library socially or seeking information. We were particularly glad to welcome our distant members—Mr. and Mrs. Farquhar, F. Beckey, G. Dawson, A. Ford, H. E. Sampson, E. R. LaChapelle, E. A. Farber, D. A. Lind and Miss F. Chamberlin—and members of other clubs, including eight foreign ones. Among the latter was Camille Couttet, the first French guide to visit the United States since F. Payot was in the Tetons.

Contributions to the Library have been received and acknowledged from Mrs. Akeley, the Austrian Federal Railways, the Canadian Pacific Railway, A. Bakewell, Dr. Braunstein, Mrs. Erlanger, F. P. Farquhar, H. S. Hall, Jr., H. Jackson, E. Knowlton, H. Mills, the New Zealand Alpine Club, J. C. Oberlin, J. H. Ross, Dr. Thorington, Dr. S. Washburn, and publishers.

Special mention should be made of several gifts—the fine large painted photograph of Mount Assiniboine in a frame nine feet long by four feet wide, with label, donated by the C.P.R., a striking addition to our assembly room; a tattered U.S. flag, taken by Mr. Farquhar in the summer of 1949 in his flight over the North Pole; a fine model of the Aiguille du Géant from Dr. S. Washburn; two framed pictures from Dr. Thorington, an original watercolor by Elijah Walton (1837-80), "Near Courmayeur," and an original drawing by Samivel; three fine mahogany cases with glass doors, which provide us with extra space for bound volumes of journals; a very large glass exhibit case; many souvenirs for the exhibit cases,

including one rare, interesting item—a fan, decorated with scenes from the Mont Blanc Sideshow, such as Albert Smith used to give the ladies after his talk.

Dr. Thorington is a most generous contributor to the Library. He has sent many cartons of long runs of journals, books, maps, catalogues, albums of photographs, scrapbooks and clippings. His exhibits of prints have given much pleasure to many non-members as well as members. On September 14th he set up an exhibit of lovely old prints of the Mont Blanc Chain and original drawings by John Auldjo, for his book, *The Ascent of Mont Blanc, August 1827*. He will soon add another of the Pyrenees.

The usual routine work continues and the Library grows apace. The total number of bound volumes in the main Library is 4826. Our greatest need is a modern card catalogue cabinet, large enough to accommodate the library cards, so that we may eliminate shoe boxes as containers. Are there any members who can help us out?

Miss Oberlin has been a great help to the officers and the Librarian. As you know, she sends out your notices. She has taken charge of the sale of Club publications and equipment and is called upon for all kinds of typing.

In this report we should not fail to mention the service given by Mr. Neil, our faithful superintendent. This summer he cleaned all the books, oiled and polished the leather-bound ones and washed the 230 shelves. At all times he sees that the furniture, exhibit cases and framed pictures are free from dust and in prime condition. Besides his splendid care of the entire building, he is always ready to do odd jobs for us cheerfully. We are extremely grateful to Mr. Neil for his assistance.

Helen I. Buck,
*Librarian*

# IN MEMORIAM

## HENRY LEWIS STIMSON
## 1867 - 1950

The public career of Henry Stimson is familiar. As a lawyer, U.S. District Attorney, unsuccessful candidate for the Governorship of New York, Secretary of War under Taft, Governor of the Philippines, Secretary of State in the Hoover Administration and again Secretary of War in the regime of Franklin D. Roosevelt, his long services mount up to a notable and in fact a unique record. Two generations of his fellow Americans admired and trusted him as a public servant.

Next to his interest in governmental service, his love of outdoor life was the dominating element in his annual plans, and his daily conversation. Much less is generally known of this side of his character. Some occasional articles he wrote and one privately printed book, *My Vacations* (1949), reveal something of his passion for hunting, riding, camping, fishing and mountaineering; but only those who knew him intimately realize how these avocations held his thoughts, commanded his spare time and even influenced his course of life.

Riding and hunting were his prime interest. He began them as a boy in Andover and ended only when crippled by arthritis in his last years. He rode if possible several times a week all his life and managed to take dozens of expeditions, indeed almost annual trips to ride, hunt or fish in Canada, the Rocky Mountains and other areas. His first ambitious exploration was a trip to the Colorado Flat Tops when he was 17. He had no interest in golf or cards, but a day for him was lost if he could not get some exercise abroad.

Secretary Stimson's devotion to mountaineering as such, that is to ascents, never occupied his whole horizon, but he did much climbing and was always interested. In 1892 he made a first ascent of Chief Mountain in the Glacier National Park area. The ascent was repeated in 1913 by an easier route. The story of the buffalo skull he found on the summit and replaced 21 years later on the second trip is known to thousands. In 1883 and again in 1896 he climbed in the Alps. The Matterhorn, the Rimpfischhorn and Zinal Rothorn were his main ascents. He was an honorary member of the Alpine

Club of London and a member of the American Alpine Club from 1913, and he took a lively interest in our Club's participation in the training of mountain troops for the Second World War. He was largely responsible for getting permission for the Club's expedition to K2 in the Himalayas in 1938.

The Secretary—as those who worked much with him came to call him—loved to battle with natural forces, with wind, cold, storm, wild animals and even wild men. He waged outdoor adventure as he waged war, or the battle of civic righteousness, with zest and élan. He was never afraid, but also he was never careless or ill-prepared. He was an outdoor sportsman of the top rank.

J. G. Rogers

## JAN CHRISTIAAN SMUTS
## 1870 - 1950

One of the great men of our time was the late General Smuts of South Africa.

He sought rest, relaxation and spiritual uplift in the hills and open spaces of his homeland, often alone, when harassed by the trials and cares of public life. According to his son, he would sometimes put a small pack on his back and go out in the veld or among the hills for days at a time, telling only his private secretary or a member of his family of his intended whereabouts. Even his Cabinet, while he was Prime Minister, did not always know how to reach him in those solitary retreats from a busy life. For many years, and until well into his seventies, he was a familiar figure on Table Mountain, often going up its steep sides by one of the actual climbing routes. He would wander around the summit plateau or sit on a rock overlooking Cape Town in its wonderful setting between mountain and sea, and lose himself in contemplation, both philosophical and practical. He is said to have reached many of his important decisions under such circumstances. That the mountains were a powerful influence on his mind and body as a statesman and as a man there seems little room for doubt.

In 1923, during his first term as Prime Minister, he said in a speech when unveiling a memorial on Table Mountain to the mem-

bers of the Mountain Club of South Africa who had fallen in the First World War:

> The Mountain is not merely something externally sublime. It has a great historic and spiritual meaning for us. It stands for us as the ladder of life. Nay, more, it is the ladder of the soul, and in a curious way the source of religion. From it came the Law, from it came the Gospel in the Sermon on the Mount. We may truly say that the highest religion is the Religion of the Mountain.
>
> What is that religion? When we reach the mountain summits we leave behind us all the things that weigh heavily down below on our body and our spirit. We leave behind all sense of weakness and depression; we feel a new freedom, a great exhilaration, an exaltation of body as well as of the spirit. We feel a great joy . . .

General Smuts was the only great figure to have attended the peace conferences after both World Wars, at Versailles and at San Francisco. The facts of his long career are too well known to need enumerating here. Leader of his country at war and in peace, a man of great courage and vision, he became recognized and respected as a world statesman. If he was not universally popular at home, it was partly because, in stature, towering above most of his colleagues, he could not always forgive their generally narrower and more provincial or even reactionary points of view. He stood rather aloof from them. He was intolerant of mediocrity and of pettiness. He was probably more influenced by ideas than by men. But he combined as few men in high places have done an idealism and a realism which some of his compatriots could not or would not understand. That he rose to a position of world eminence from a country in which fewer than two million of the inhabitants are sprung from people of European stock is all the more remarkable.

In our Club library hangs a very fine, full-length photograph of the General (he always preferred to be so called rather than by his later title of Field Marshal). He is standing just outside the official residence at Groote Schuur, with Table Mountain rising in the background. At the bottom in his own hand is written: "To my friends in the American Alpine Club, J. C. Smuts, 1948."

H. S. Hall, Jr.

## ALFRED D. LINDLEY
## 1904 - 1951

Death came to Alfred D. Lindley and two friends in the crash of a private plane in Nebraska on 22 February 1951. They were en route to Aspen, Colorado, for a two weeks' skiing holiday. The plane was owned and piloted by his friend, Edmund P. Pillsbury.

Alfred D. Lindley, a member of the American Alpine Club since 1932, first came to the attention of the mountaineering fraternity in that year when he and Erling Strom planned and brilliantly executed a winter ascent of the north and south peaks of Mt. McKinley, the first ascent of both peaks by one party. It was one of the first ascents of an Alaskan peak in which skis were used as a helpful and effective mode of transport.

Lindley, at this time, was only 28 years of age, but he had been active in mountaineering since he first climbed the Jungfrau at the age of 16. Although from time to time he climbed in the Alps, the Canadian Rockies, the Tetons and the Wind River Range, his chief interest developed into mountain skiing, of which he was an early devotee and pioneer. Long before the great modern popularity of this sport developed, and before the advent of the ski-tow and the chair-lift, Lindley and a small group of friends were pioneering modern skiing at Strom's camp at Assiniboine in the Canadian Rockies (a two-day journey) in the late twenties and early thirties. In 1930 he was one of a party who skied from Jasper to the Columbia Icefield and return, a ski trek of nearly 250 miles, which also included a winter ascent of Mt. Castleguard.

His interest in skiing went far beyond that of an active participant and included the pioneering and development of new skiing centers. He was a participant in Olympic competition in the year 1936, and at the time of his death was Chairman of the Skiing Committee of the United States Olympic Committee.

Though mountaineers and skiers will always associate his name with activities in the mountains, they may not appreciate that he was one of the nation's outstanding amateur sportsmen. In 1924 Lindley stroked the Yale crew which won the Olympic races of that year at Paris. He was an excellent sailor on the inland waters of this country, a boxer who competed successfully in Golden Gloves Tournaments, and a competent horseman and polo player. Tennis, squash racquets, golf and hockey also claimed his participation.

There was nothing of mediocrity in any of these accomplishments. He exhibited outstanding skill in many sports and invariably participated in intercollegiate, national or international competition. He was extremely modest and exhibited the highest qualities of sportsmanship.

Alfred Lindley was born in Minneapolis in January 1904. He graduated from Yale University in 1925 with a degree *magna cum laude*. In 1936 he met Grace Carter, also a participant in Olympic ski competition; and they were married a year later. He is survived by her and by their son and daughter. By vocation he was a lawyer, admitted to the bar of the State of Minnesota in 1930. By inheritance he might have led a life of comparative ease and devoted his spare time to his great interest in the field of sports, in which he was so proficient; but desire to be of public service was inherent in his character. He entered the field of politics as a strong supporter of Harold E. Stassen in his successful initial campaign for governor of the State of Minnesota, and was equally untiring in his efforts in support of Governor Stassen's campaign for the Presidency. He himself campaigned successfully in a difficult labor district in 1940, became a member of the Minnesota State Legislature, and was the Republican nominee for Congressman in the last Congressional campaign. Here again he faced difficult odds to unseat the incumbent with strong labor support, and missed the election by a very slim margin.

Lindley was President of the Minneapolis Chamber of Commerce in the year 1941, which position he resigned to volunteer in the United States Navy immediately after the outbreak of hostilities. He served four years with distinction in the Kiska and Attu campaigns in the Aleutians, and aboard the aircraft carrier U.S.S. *Hornet* in all its major fleet engagements. He rose through successive promotions to the rank of Commander. In 1948 he again returned to government service as administrative assistant to the Administrator of the Marshall Plan in Great Britain and served for nearly two years in that capacity.

Alfred Lindley lived a full, exciting and happy life and endeared himself to a legion of friends both far and wide with his charming personality and his zest for life which he communicated to his companions. Many honors came to him, but never were they the perquisites of high office or position, but rather the result of pure per-

sonal achievement. To him life was a challenge in every respect, and he had great courage. He attempted and achieved an astounding variety of accomplishments in a comparatively short span of life. The mountains were a challenge to him, whether to scale their summits on foot or to descend their steep slopes by the swiftness of a pair of skis.

In a memorial resolution adopted by the Minnesota State Legislature ten years after his departure as one of its members, it was said of him:

> Alfred D. Lindley was an outstanding citizen and leader of his community who gave unstinting support to all activities designed to advance the well being of his community, state and nation; and in his contacts with his fellow men, he was ever straight-forward, considerate and possessed of broad human sympathies . . . We desire to pay tribute to this gallant son of Minnesota, who in a short span of life did so much for the welfare of his community, state and nation.

He will be greatly missed in many walks of life and especially by those who had enjoyed the pleasure of his companionship in the mountains.

HENRY S. KINGMAN

**BENNET BRONSON**
**1887 - 1950**

Bennet Bronson, a member of the American Alpine Club since 1931, died in Waterbury, Connecticut, on 23 November 1950. A graduate of the Taft School and of Yale (1909), he was with the Oakville Company, which manufacturers metal goods, from 1909 until 1923, except for the period of his service in the Army during the First World War. In 1923 he joined the Scovill Manufacturing Company, of which he was vice-president and director at the time of his death. Among other positions which he held was the chairmanship of the Naugatuck Valley Industrial Council. Between 1924 and 1939 he made a number of winter ascents in the White Mountains and the Adirondacks, and in 1927 and 1930 he climbed around Arolla and in the Oberland. He leaves his wife, the former Eleanor Lindley; a son, the Rev. David B. Bronson; and a daughter, Mrs. Edith de Chadenedes.

# BOOK REVIEWS

*Regards vers l'Annapurna,* by Maurice Herzog and Marcel Ichac. Introductions by Lucien Devies and Maurice Herzog. 84 pages of illustrations, with 12 pages of commentary. Grenoble and Paris: B. Arthaud, 1951.

This excellent picture book in color is, I believe, the best modern photographic record of a Himalayan expedition that has been published. Beautiful and exciting photographs record the outstanding success of the splendid French expedition to Annapurna, the highest mountain in the world yet climbed. That Annapurna, the first "eight-thousander" to be conquered, was a terrible adversary is shown in various ways, including views of the severely frostbitten leader, Maurice Herzog. The several members of the expedition whose photographs are included are to be congratulated for this fine book, even as the expedition itself is to be congratulated on their superb success.

In his introduction M. Devies states: "Annapurna! Plus encore qu'un triomphe sur la nature, c'est une victoire sur soi. Comment montrer, avec plus de force, que le destin de l'homme, c'est bien le dépassement de lui-même."

R. H. Bates

*A History of Mountaineering in the Alps,* by Claire Eliane Engel. 296 pages, 24 plates, with a foreword by F. S. Smythe and a bibliography of Alpine literature. New York: Charles Scribner's Sons, 1950. Price, $6.00.

Indefatigable Miss Engel describes a century and a half of ascents in the world's richest climbing area. From the early pioneers we move to de Saussure and the story of the first Mont Blanc attempts and ascents; then on to the colorful "golden age" of Leslie Stephen, Whymper, Tyndall and Wills, and the early days of the Alpine Club of London. The description of this best-known part of Alpine history is perhaps the best section of the book, though as we reach the 1930's there are graphic accounts of some of the terrific climbs made then on the Matterhorn and the Eiger. Among Miss Engel's stories is one of de Saussure sitting at the foot of Mont Blanc and reading the *Iliad* as he waits for the weather to clear; in some respects mountaineering has changed little since the 18th century.

The author has some difficulty in organizing her very complex material. Among her subjects of discussion are famous guides, nationalism in mountaineering, and the literature of climbing; occasionally she introduces groups of quotations. Despite the size of the subject and the half-popular, half-historical approach, the material is well presented and the book is worth owning. The illustrations are pleasant, and the bibliography is very useful.

R. H. B.

*Climbs in the Canadian Rockies,* by Frank S. Smythe. ix+260 pages, with three maps and 39 illustrations, two in color. London: Hodder & Stoughton, 1950. Price, 20/-.

There are three kinds of books about mountains. One kind makes scientific specimens of them; another makes glamour girls of them; a third makes friends of them. It is very sad that this is Frank Smythe's last book, because his have all been of the friend kind. No one else has written of mountain adventures with such a harmony of love, excitement, poetic insight, humour and disapproval. In this vivid account of failures and ascents from Mt. Alberta to Mt. Lloyd George, plus chapters on The Beaver and the wartime training of the Lovat Scouts, you will find the most libellous remarks on record about the Canadian Underbrush, Canadian Screes, and People Who Won't Drink Water While Climbing:

> I have climbed with men who carefully sucked stones on their waterless way, while they mumblingly reproved me in the intolerable manner of the abstainer when I drank out of every stream I came to. Yet it appeared to me that I was going better . . . during the latter half of the day. I might also point out the danger of a stone in the mouth, as cases have occurred where men have swallowed their stones in the excitement of a sudden emergency.

You will find alarming descriptions of escapes from crevasses and of close calls from lightning ("My feet felt as though they were being driven into the ground and impaled on innumerable upright needles"), from rock falls, from avalanches, and from solo climbing. You will find pride (in coming safely back from what he almost admits was a naughty solo excursion on Mt. Assiniboine: "The situation had changed from light-hearted fun to something dour and grim"), and you will find prejudice. Smythe sinks his first piton in 30 years of mountaineering into a Canadian Rocky, and the chagrin brought on by this compromise echoes through the next

chapters. Shortly afterwards, however, he cheerfully boards a plane and flies over hundreds of miles of what would have been backpacking into the Lloyd George Range. It is hard to see how one compromise differs in essence from the other. But, as he says, "it is knowing where to draw the line which counts in life."

You will find in profusion the wry humour which is such a trademark with him:

> To reach this ledge it was necessary to execute a manoeuvre on to what is known in climbing circles as a mantelshelf . . . In order to understand the problem the reader should cease from reading this account and climb on to his own mantelshelf . . . Where the ledge commenced it was blocked by a large slab of rock. It was not possible to pass above or below . . . (so) I made my way over it, embracing it with the same cold and calculating care with which as a small boy I embraced my aunts.

You will find many passages of the poetic description with which he is equally at home:

> The valley we entered was perfect in its beauty. Mist was lying in 'ts meadows and twining amongst the conifers, exploring the lacery of branches with white and slender fingers. It lay in silvery pools caressing the tall plants . . . I talked with David, but my own voice sounded strange and unnatural in my ears and I did not hear very much of what was said. I was listening and listening for what—the pipes of Pan? I do not know. I only know I was under the spell of some subtle enchantment.

And, as always in Smythe, there are the graceful, agile transitions from handholds in the sublime to footholds in the comic. This book is filled with hair-raising adventures with "dark brown objects" which turn out to be bears, are invariably ferocious, charge directly at him, and are only deflected at the last moment by bear-curdling shrieks at the volume and pitch of which Smythe indicates satisfaction. There should, perhaps, be a study some time of the unique relationship between Frank Smythe and the bear. Clearly there was communication. The bears unfailingly concluded that here was Something which did not love a bear. Topping all else, this book relates *the* bear story with which Frank Smythe has regaled various mountaineering gatherings. It concerned a large grizzly which had been foraging around Jasper Lodge where Smythe was stationed with the Lovat Scouts:

> One night I arose from bed and proceeded to descend the steps. I was half-way down when I perceived at the base of them a dark shape which moved slightly. I was descending on top of the bear.

> There was only one thing to be done, and I exercised the only persuasion I could think of. He gave one bound and rushed away as hard as he could go, exactly like a cat when from a window you hurl a basin of water upon it . . .

R. P. BRUNDAGE

*This My Voyage,* by Tom Longstaff. 324 pages, with 23 illustrations and 14 sketch maps. London: John Murray, 1950. Price, 21/-.

This remarkable book of adventuring is the autobiography of a recent past-president of the Alpine Club who is still going strong in his 76th year. At the age of 15 he declared that his ambition was mountain travel. His father wisely advised him to take a medical degree first, and Dr. Longstaff has served since then in two World Wars. He has also climbed in practically all the major ranges of the world—Alps, Caucasus, Himalaya, Rockies, Selkirks—as well as in Greenland and Spitsbergen. He took part in expeditions to Tibet in 1908, Spitsbergen in 1921, Mt. Everest in 1922. He visited Spitsbergen again in 1923 and the Garhwal Himalaya in 1927. He led the Oxford University expedition to Greenland in 1928. In 1907 he ascended Trisul, and two years later he explored the Siachen Glacier and discovered Teram Kangri. He was the first to see into the inner sanctuary of Nanda Devi. He was awarded the Gill Memorial by the Royal Geographical Society in 1908 and the Founder's Medal in 1928.

For this reviewer, some of Dr. Longstaff's remarks on Canadian mountaineering have special interest:

> There is no lack of beauty. The individual scale of these mountains is so small—though their extent is vast—that flowing waters, forest, glacier and peak can be seen in one harmony: a form of composition completely lacking in the Himalaya. There is nothing more beautiful in any mountain scene, but its menace is inescapable. The secret may lie in the density of the forests and their pathlessness: here is no reassurance of ancient tracks, no passes crossed by generations of caravans. The mountains of Europe and Asia recall gods and dryads and the long procession of man. These empty wilds are peopled only by our bare imagination, apt to primitive terror: there is no past except starvation.

How strange is this point of view to others who have climbed in Canada, feeling the peaks friendly and thinking, however ignorantly, that the Himalaya might terrify! It is surprising also that the author considers his most difficult climb to have been Mt. As-

siniboine—although, to be sure, his route by the N.W. face (1910) has never been repeated. The lapse of time has once betrayed his memory. He says (p. 221) that he broke a finger while he was ascending a new peak with Oliver Wheeler during a crossing of Abbot Pass. In reality, this happened on Chimney Peak, attained from Consolation Pass (*C.A.J.*, III, 78).

J. Monroe Thorington

*Postscript to Adventure,* by Lord Schuster. 214 pages and 12 illustrations, including 3 sketches by H. G. Willink, with an introduction by Arnold Lunn. London: Eyre and Spottiswoode, 1950.

It is said that the late C. Myles Mathews once wished to possess an Alpine library: "I began with *The Playground of Europe,* and tried each succeeding volume by its standard. My library remained a collection of one volume. It is so no longer. Mr. Schuster's book [*Peaks and Pleasant Pastures*] has joined it on the shelf." Lord Schuster, like Dr. Longstaff a past-president of the Alpine Club, is a master of style; and his new book is scarcely less enjoyable than what he has written in earlier years. It is, however, largely a collection of papers read before mountaineering clubs; and, when the author has made a good point in one talk, he is naturally inclined to repeat it in the next.

We enjoyed particularly the chapter on the Meije, and rejoiced on finding the noble valedictory read by the author on the occasion of his retirement from the presidency of the A.C. There is a long and fascinating section on John Tyndall as a mountaineer, and there is a clever duel with Arnold Lunn over the matter of mysticism:

> To say that there can be mystical communion between a mountain and a man is therefore nonsense. A mountain is a portion of the earth's surface which, as a result of natural processes, stands higher than other portions. If it has a "shadowy personality" it is because we "attribute" such personality to it. And you cannot have a mystic communion with a lump of rock and ice; it has no spirit, no love, no compassion. And nothing which we do or say, or think or feel can endow it with these attributes. You cannot be a mystic all by yourself. Mysticism is a state which requires some relationship to something outside the mystic.

Convincing enough to make this reviewer award a decision on points to Lord Schuster.

J. M. T.

*Vocation Alpine,* by Armand Charlet. 206 pages, with 13 illustrations and a preface by Dr. Azéma. Neuchâtel and Paris: Victor Attinger, 1949. Price, 450 francs.

Armand Charlet will go down in mountaineering history as the most brilliant guide the valley of Chamonix has produced—a temperamental and exacting taskmaster who (be it said in the same breath) never spared himself. His ancestors were long established at Argentière; many were guides, among them Jean-Estéril Charlet (Charlet-Straton), who gained fame by his first ascent of the Petit Dru in 1879. Much of the talk that Armand heard as a boy he now recalls, delightfully, in early sections of the book. His own father, though not a guide, was a true lover of mountains; he encouraged his sons to climb and often accompanied them.

Youthful adventures in the region adjacent to the Col de Balme and the Aiguilles Rouges were followed by greater expeditions. An ascent of the Tour Noir on a fine day in 1911 was a revelation to Armand: he saw the Matterhorn—while Edward Whymper lay dying in Chamonix. Armand was then twelve years old. Not many years later, Armand and his brother Georges were ski champions of the valley; and in 1919 they made their debuts as professional guides (*aspirants*). But for Armand, who spent two winters with Alpine troops in the Briançon area, the first 4000-m. peak was not (curiously enough) a summit of the Mont Blanc chain, but the Barre des Ecrins.

Although Charlet, like other top-flight guides, made his name on rock, it is not difficult to see that the Aiguille Verte was his own mountain. He made more than 59 ascents, in all seasons and by at least twelve different routes. The notch between the Rocheuse and Aiguille du Jardin is called Col Armand Charlet (3998 m.) on the Vallot map. As his friend Segogne wrote, "It is better to have your name on a col of 4000 m. than on a gendarme of lesser importance."

Of his patrons Charlet says too little. They were chiefly the best members of the G.H.M. Few Americans are mentioned, other than Miss O'Brien and R. L. M. Underhill, whom he guided in the first traverse of the Aiguilles du Diable in 1928. That he regarded this as the culmination of his career is natural, but it is unfortunate that the climax should cut short a book which could have been longer without losing interest. J. M. T.

*Au Royaume du Mont-Blanc,* by Paul Payot. 305 pages, with 97 illustrations. Bonneville (Haute-Savoie): Imprimerie Plancher, 1950.

A year ago, we reviewed the modest text written by Paul Payot to accompany the splendid photographs by G. Tairraz in *Chamonix et le Mont Blanc.* Anyone who knew Payot as a diligent historian must have felt that he must go on to produce a more comprehensive book about his valley, but one did not expect anything so fine and so thoroughly successful as the volume now before us. It offers in small space the authoritative modern summing up of all that we have found in the earlier works of such men as Charles Durier, Stephen d'Arve and C. E. Mathews. It should be on every climber's bookshelf, for there is a great deal to be learned from it, and much that is new. For instance, the 13th-century designation for Chamonix was *Campus munitus.* Payot believes that this should be translated as "enclosed plain," rather than as "fortified camp." He rejects the opinion quaintly held by his uncle that the name was derived from the two mills of the Priory—*Champ du meunier.* The first to mention Mont Blanc, he tells us, was François de Sales, in a manuscript of 1603. In a brief paragraph he describes the amazing expedition made in the last century by a guide of Bonneval who, when cattle plague forbade the traverse of animals through Savoy, took a herd of 400 sheep across the Col du Géant from Aosta to the Montenvers. The history of the valley and the account of its resources, and the story of the development of Chamonix itself, are followed by records of the first tourists and of the conquest and subsequent ascents of Mont Blanc and its neighbors. The illustrations, chiefly from the author's collection, are not to be found in anthologies; the old hotels, the tourists of another day, the strange spectacle of a herd of cows on the Mer de Glace are highly entertaining.

The growth of Chamonix as a tourist center depended largely on interest in Mont Blanc and excitement generated by the ascent. Let us hope that this excellent book will somehow lead to the restoration of the politically suppressed Chamonix Museum, which once so attractively exhibited the historic relics of bygone events, and whose absence is a present disgrace.

J. M. T.

*Buch der Talschaft Lauterbrunnen,* by Hans Michel. 503 pages, including bibliography, 64 photographic illustrations and six color plates from old prints. Interlaken: Verlag Otto Schlaefli. Price, 50 Swiss francs.

An interesting recent development in Alpine literature is the succession of local social histories, many of which we have reviewed in these pages—Gräber's *Volksleben in Kärnten,* Perkonig's *Kärnten, deutscher Süden,* Weiss's *Volkskunde der Schweiz,* Guichonnet's *Visages de la Savoie,* Veyret's similar work on Dauphiné (both in the Horizons de France series), as well as the books on Swiss cantons, six of which have already appeared in the Volkserbe der Schweiz series.

The present massive work covers the occurrences and customs in the Lauterbrunnen villages during the seven centuries from 1240 to 1949. It has additional chapters on the streams and waterfalls, the animal and plant life of the mountains. There are reproductions of 13th-century documents in which Lauterbrunnen ("in claro fonte") is first mentioned; there are genealogical tables; there is an interesting historical discussion of the early routes (chiefly the Wetterlücke and the Petersgrat) connecting the Lauterbrunnenthal with the Lötschenthal. The illustrations are well chosen; they include fine pictures of avalanches, waterfalls and climbing, and some superb reproductions of Lory's color prints.

J. M. T.

*The Story of Mountains,* by Ferdinand C. Lane. 488 pages, with tables and index; 32 full-page illustrations from photographs and a panoramic end-paper. Garden City, N. Y.: Doubleday and Co., 1950. Price, $6.50.

This is one of a series of books on global geography. Preceding volumes have dealt with seas, lakes and rivers. It is an immense assignment. *The Story of Mountains* does not fulfil the publisher's promise that it "contains everything there is to know about mountains; their origin, their structure, their vegetation, their importance in history and literature, and their effect upon man himself." The portions given over to physical geography are extremely interesting; one learns a lot about heights and depths, mountain sculpturing, climate and geography. There are numbers of useful reference tables.

But the author has not proofread proper names, and he is not a profound mountaineering historian. Among misprints of names one finds Stabler for Stabeler (p. 11), Fulsom for Folsom (p. 59), Bancroft for Barcroft (p. 172), Mourad-Aas for Monrad-Aas (p. 173), Coutlet for Couttet (p. 369), Fall for Hall (p. 387), Zerbrüggen for Zurbriggen (p. 402) and Lorch for Lord (p. 427). In the field of climbing history, the mistakes are worse. It has long been known that Kinney and Phillips did not reach the highest point of Mt. Robson (p. 96). The Columbia Icefield is not solely in British Columbia (p. 152). The author has confused Andreas Hofer, of the Tyrol, with Arnold von Winkelried, the Swiss hero of 1386 (p. 207). The summit of the Jungfrau is 1834 ft., not "a few hundred feet," above the Jungfraujoch (p. 212). The Engadine is a valley, not a range (p. 346). The account of the ascent of the Matterhorn (p. 363) is, as the publisher suggests, "unforgettable"—but largely, as the publisher does not suggest, on account of its inaccuracy. The author has no comprehension of the part taken by Dr. Paccard in the first ascent of Mont Blanc (p. 386). Josias Simler was born in 1530, not in 1672 (p. 417). The latter year was that of Dr. Scheuchzer's birth.

The illustrations are magnificent, being chiefly from the American Alpine Club's Sella Collection.

J. M. T.

*Steve Mather of the National Parks,* by Robert Shankland. 326 pages, 24 illustrations, with an introduction by Gilbert Grosvenor. New York: Alfred A. Knopf, 1951. Price, $4.00.

There are really several books within these covers. First, there is the authorized biography of a great public benefactor who has been insufficiently appreciated outside a relatively narrow circle. Stephen Mather's vision and energy were largely responsible, as must now be realized more widely, for making many of our most important mountain ranges so accessible. Second, there is an authoritative history, from the earliest days to the present, of our National Park Service. The author has had access to a wealth of documentary material, much of which seems never before to have been revealed to the public. Third, there is a fascinating account of high-level politics in Washington, and of the struggles waged by conservationists—particularly Mather himself—against the pressures exerted by repre-

sentatives of various special interests. The author, whose style is as clear and bracing as good Western air, tells numbers of interesting anecdotes about men of eminence in the Washington scene and about picturesque figures of the West. One exceptionally dramatic story is of an Arizona politician's protracted efforts to keep the Grand Canyon out of the public domain. Much of Mather's success was due to his gift at enlisting in support of the National Parks such public-spirited citizens as Mr. Rockefeller. Fourth, there is an illuminating account of the borax industry, which gave to Mather the personal fortune that enabled him to dedicate himself, in the best years of his life, to the preservation for our citizens of many of our country's natural beauties.

Like all true Californians, Mather grew up to be a lover of rugged skylines. For most of his adult years, he was an active member of the Sierra Club. In 1904 he visited Switzerland, and in 1905 he climbed Rainier. From that time on, most of his summer vacations were spent in the Sierras or the Rockies. Though his record of ascents may not have been spectacular, it was long and continuous, and included many peaks of 10,000 ft. or more. In any case, his record of public service is such that climbers in this country owe him an eternal debt of gratitude. HENRY E. MILLS

*Scholar Mountaineers,* by Wilfrid Noyce. 164 pages, with 12 full-page illustrations and wood-engravings by R. Taylor. London: Dennis Dobson, 1950. Price, 12/6.

What does the title *Scholar Mountaineers* lead one to expect? Maybe a series of essays about dons who have climbed, or an account of the climbers who have written scholarly works on the history and literature of mountaineering. Instead of either of these, Wilfrid Noyce has given us, under this title, a dozen brief, informal studies of figures whom he describes as "Pioneers of Parnassus": Dante, Petrarch, Rousseau, De Saussure, Goethe, William and Dorothy Wordsworth, Keats, Ruskin, Leslie Stephen, Nietzsche, Pope Pius XI and Captain Scott. Each of them is studied "simply in relation to mountains"; each is considered as having made "a peculiar contribution to a certain feeling in us." Such is the author's interest in them (and, of course, in mountains) that a reader is soon prepared to suppress the little question that nags at first: How many were "scholars," and how many were "mountaineers"?

Reading on, one becomes more and more interested in these selective treatments of the "Pioneers," and in the differentiation of attitudes which they expressed or—in most cases quite unintentionally—fostered. Dante appears, for example, as "the trembling and unwieldy novice" who "comes near to wrecking the whole expedition through Hell"; and Keats is detected in a moment of what seems to be bravado—composing a sonnet on the summit of Ben Nevis. The discrimination of various attitudes toward mountains, Nature and action induces renewal of inquiry concerning the motives of (say) our friend X. What does a mountain stand for, in his eyes—cathedral, or laboratory, or gymnasium? Coming out of the mountains, is he filled with wonder and humility, or with satisfaction over his prowess? Is his climbing sport, or is it sublimation? Does his experience seem to have bound him closer to life and his fellow beings; or has it rather set him apart, in contemptuous and lonely pessimism? Can it perhaps be said that, after all, X just climbs because he likes to? *Scholar Mountaineers* encourages fresh pointing of all such questions.

D. A. Robertson, Jr.

*First on the Rope,* by Roger Frison-Roche. Translated by Janet Adam Smith. 246 pages. New York: Prentice-Hall, 1950. Price, $2.75.

Written by a mountaineer and skier who is thoroughly familiar with the region of Chamonix, *First on the Rope* has already achieved status as a best-seller in France. Now, translated into English by Janet Adam Smith, author of *Mountain Holidays,* it is bound to turn up, I should think, on the reading lists of mountaineers throughout this country. So few works of fiction deal explicitly and at length with climbing that it would be very difficult to forego the pleasure of giving this one a trial.

The first part, "The Birth of a Vocation," sets forth the circumstances of a fatal accident. Jean Servettaz, a guide of great experience and ability, reluctantly continues an ascent of the Dru, under threatening conditions of weather, at the insistence of his American client, Henry Warfield, Jr. Lightning strikes the party and kills Servettaz. The porter Georges à la Clarisse succeeds in bringing the hysterical Warfield down ("Alone with a loony on the Drus—what a nice trade a guide's is!"), but suffers severe frostbite. Pierre

Servettaz, son of Jean, goes up with the party to recover his father's body, but fractures his skull in a fall from the icy rocks. Georges loses all his toes, and Pierre develops acute vertigo. The second part, "The Making of a Guide," tells how these two triumph over their handicaps, making together at last the ascent of the north face of the Aiguille Verte. In the course of the story, we are made acquainted with the friends, relatives and sweetheart of Pierre; and we learn something of their interest in hotels and cows, as well as in mountains.

*First on the Rope,* I can testify, provides highly satisfactory diversion for a Sunday afternoon; but it does elicit a couple of comments which, though not restricted in application to this book alone, may have to be considered adverse. First, the demon that limits the understanding of every one of us makes it extraordinarily difficult for a writer to draw a convincing character—a "whole person"—of nationality different from his own. Take this Henry Warfield, Jr., who is described as being affluent and as having a "passion for record times." I should hesitate to deny that the traits of Warfield may be found to exist, severally or even together, in various climbing compatriots of ours; I say merely that M. Frison-Roche has not persuaded me of the reality of the bundle of traits called Warfield. Second, having noticed a drop in my interest after the first hundred pages or so, I fell to wondering just what *can* be done with mountaineering in a work of fiction. It would seem that there almost has to be a dramatic, and maybe even disastrous, climb. But the dramatic part of a climb can best be recounted in a few pages. If you stretch the story by piling on details of terrain or technique, or by following up the subsequent goings-on in the valley, or by putting in *another* dramatic climb, you impair the singleness of effect. Perhaps some day a writer of Melville's stature will produce a mountaineering novel on the grand scale. Of the climbing stories now on the shelves, Montague's "Action" seems to me still to have the most satisfactory shape and length for the purpose.

D.A.R., Jr.

**BRIEFER MENTION**

*Terra Ladina,* by Hermann Hiltbrunner. 72 pages of text, with 53 full-page illustrations from photographs by Michael Wolfgensinger. Zürich: Scientia Verlag, 1944.

This is a picture book, now in its second edition, revealing the beauty of the Engadine, its landscape and architecture, from the source of the Inn at the Maloja Pass, from St. Moritz and Pontresina, to the lower reaches of the valley at Guarda, Ardez and Schuls-Tarasp. The picturesque lanes of the villages are a principal subject; their light and color are as evident as in the paintings of Segantini. Portraits of the people and pictures of work in the fields round out the values of this corner of Switzerland. A graphic text by a native poet forms an admirable descriptive background.

J. M. T.

*Dolomites,* by Félix Germain. 200 pages, with many photographic illustrations and two maps. Paris and Grenoble: B. Arthaud, 1950.

The 95th volume in the Beaux Pays series, this is one of the best picture books of the Dolomites. A map shows the location of the main group between the Adige (Pusterthal) and the Piave, and the separation of the eastern and western divisions by the trench of Val Badia and Val Cordevole. The western area, between the Val Gardena and S. Martino di Castrozza, contains the highest summit (Marmolata), while the eastern includes the mountains about Cortina. There is also an account of the Brenta groups between the Lake of Garda and Bolzano, covering the peaks accessible from Madonna di Campiglio. An excellent and informative French text accompanies the pictures. Here is a wonderland of grotesque form and reflected color to which many of us long to return.

J. M. T.

*Trois Curés en Montagne,* by Jean Sarenne. 234 pages and 15 illustrations. Paris and Grenoble: B. Arthaud, 1950.

Chance encounter with copies of *La Montagne* arouses a passion that drives its subjects from humble beginnings on a local hillside to acquisition of advanced technique and adventure on the Dru. There is nothing naive about this. With charming simplicity, three young *séminaristes* have told their story—Tartarins playing Ar-

gonauts, for euphony in the title of their book calling themselves *curés*. With little money and no knowledge of Alpine reality, they secure meager equipment and starvation provisions, and follow, where angels fear to tread, the mountain paths of Dauphiné into the world of marvels above the snow line. They have their private G.H.M., and its badge is in their hearts.

J. M. T.

*Fabulous Destinations,* by John Nicholls Booth. xii+239 pages. New York: Macmillan, 1950. Price, $3.50.

*Fabulous Destinations* describes the post-war wanderings of an amazing man: John Nicholls Booth is a skilled journalist, a nationally known magician, and a well-known Unitarian minister. His book is of only passing interest to the serious mountaineer, though it describes a visit to Phari Dzong in Tibet and some fine views of Chomolhari. As a journalistic account of recent travels throughout Asia, however, it is well worth reading. In it Mr. Booth shows exceptional ingenuity, imagination and the ability to improvise. His visits to normally forbidden areas, and his interviews with many of the world's great men, show that exciting travels are still within the grasp of the adventurous man who has courage and initiative.

R.H.B.

*Rock for Climbing,* by C. Douglas Milner. viii+128 pages, with 97 photographs by the author. London: Chapman and Hall, 1950. Price, 25/-.

In *Rock for Climbing* C. Douglas Milner presents an excellent picture book of climbs in the English Lake District, Wales, Skye, the Pennine Alps, Chamonix and the Dolomites. The photography is generally good, and the human interest in the illustrations is first rate, especially in the English and Welsh material, which this reader found the most interesting part of the book. Unfortunately, some bad belaying is shown in these photographs, and it is to be hoped that some of the rope-handling will not be copied by the book's readers.

The introductory pages, on the other hand, give an excellent discussion of rock ascents and the British view on the use of artificial aids. Interspersed comments throughout the book are good; the approach to the subject is sound; and a fine feeling for the pleasures and excitement of rock climbing pervades the whole.

R.H.B.

*A Progress in Mountaineering,* by J. H. B. Bell. xii+424 pages, with a foreword by F. S. Smythe, 34 photographic illustrations, drawings by Joan Tebbutt, and maps and diagrams by Mrs. Bell. Edinburgh and London: Oliver and Boyd, 1950.

Readers of the late Frank Smythe's *Climbs and Ski Runs* will doubtless remember the bivouac on the Aiguille du Plan and "my friend, Mr. J. H. B. Bell, of Auchtermuchty, Fife." This well-known Scottish mountaineer has now written a book that deals both with mountain craft and with his own ascents. His purpose is to encourage young climbers to start building up, on the nearest British hills, experience that will enable them later "to go exploring and climbing on the greater mountains of the world with a fair measure of confidence and safety, and without the assistance of professional guides." The book is divided into five sections: the first is introductory; the second and third are about "British Mountain Technique" and "Scottish Mountain Expeditions"; the fourth and fifth, about technique and expeditions in the Alps.

D.A.R., Jr.

*The Mountaineer's Week-End Book,* by Showell Styles. 408 pages, with decorations by Thomas Beck. The Week-End Series. London: Seeley Service, 1950. Price, 12/6.

This grabbag for a rucksack is of course intended for British mountaineers, but it makes for a feeling so happy and serendipitous that it must surely appeal to others, too. "It is," the Forewarning announces, "a Compendium, this book, of Things About Mountains." Look up the Chough, or the Alpine Lady's Mantle (*Alchemilla Alpina*). Check the food value of bully beef, or the height of Olympus, or the length of a Norwegian mile. Turn to page 205 if you have a blister, or to page 170 if you are weatherbound and can not remember the rules of Battleship. Or just browse among the "Bits and Pieces," or settle down to read through the short anthologies of mountain prose and poetry—"The Great Game" and "Mountain Air." The book, which seems to induce cheerful humming noises, even supplies the words and music of some appropriate songs, including several of Geoffrey Winthrop Young's. The decorations are pleasant, too.

D.A.R., Jr.

*Guide to the John Muir Trail and the High Sierra Region,* by Walter A. Starr, Jr. Fourth edition. xii+130 pages, with a foreword by Francis P. Farquhar, map in pocket at back. San Francisco: Sierra Club, 1951.

In a Prefatory Note, David R. Brower, Chairman of the Sierra Club Editorial Board, writes: "For this edition the type has been completely reset, much new material has been added, and the format has been altered so that there are many more words to the knapsack-ounce. But it is still Starr's *Guide*—and the passport to some of the most livable mountains ever wrought."

# VARIOUS NOTES

## United States: Climbs in California

*Castle Rock Spire, Sequoia National Park.* Looking S.E. from Moro Rock on the Generals' Highway, across the Middle Fork of the Kaweah River, one sees the serrated ridge of Castle Rocks, rising to an elevation of 9150 ft., more than 5000 ft. above the river. In the foreground of the mountain mass rises a slender, bladelike needle: Castle Rock Spire. It does not tower above the other peaks, but it is made spectacular on the valley side by a sheer drop of more than 1500 ft. At the notch where it joins the side of the mountain, it rises more than 500 ft.

Many climbers have gazed at the spire, but until recently few have ventured to try its defences. Here was a Sierra climb of the type which had to await the development of modern "rock engineering," liberal in use of pitons and bolts not only for safety but also for direct aid. The first climbers who visited the spire (Anton Nelson, DeWitt Allen and Ted Knowles, in 1947) reported that earlier estimates, made at a distance, had not belied the difficulties of the climb. It would take a strong party, with plenty of hardware. After more than two years of reconnoitering and preliminary attempts, the first ascent of Castle Rock Spire was accomplished on 27 April 1950 by Will Siri, Bill Long, Jim Wilson, Al Steck and Phil Bettler, all from the San Francisco Bay Area. It took two and a half days on the rock.

The beginnings of success were really in September 1949, when Siri, Wilson and Bettler located and climbed more than halfway up what proved to be the best and perhaps the only feasible route. From our camp at the notch, a long fourth-class traverse leads out to the right across the E. face over a series of broken rocks and ledges. Rounding a corner, the route drops down to the point where the face is joined by a buttress. A 100-ft. lead up a 75-degree crack in the buttress brings one to a platform of chockstones in a gap where it joins the wall of the spire. Passing through the gap and continuing diagonally down along the other edge of the buttress, one finds a vertical right-angle chimney rising 60 ft. toward the N.E. ridge of the spire. This chimney—start of the really difficult climbing—required a ladder of pitons up its full length. I had

the honor of exhausting myself on this lead. The top of the chimney was blocked by a horizontal overhang. Finding no usable cracks, I got around it with two expansion bolts. I then relinquished the lead to Wilson, who made another 30 ft. before darkness drove us back to our camp at the notch.

The next morning, after prussiking up a fixed rappel rope, Siri resumed the attack. He made a beautiful lead to the right out of a second overhang. Above, he gained the lesser angle (still 80 to 85 degrees) of the N.E. face and, cutting back to the left, followed a crack up 50 ft. There I found him under yet a third overhang. This was not so large as the others; but, being without a good piton crack, it required an expansion bolt. A rounded fissure into which one could almost jam a leg and arm led upward. The top of this was to be the high point of the trip. We had spent two full days on the rock, and our time was running out. We had made only a little more than half of the climb, but knew that our route would go and were sure that next time the spire would be ours.

For the final and successful attempt, Bill Long and Al Steck were added to the party. On the morning of 25 April 1950 we were again in camp at the notch. This time we were prepared to bivouac at the chockstone ledge. After taking over supplies, Long, Steck and Wilson renewed the attack. They reached the previous high point and established fixed ropes. That night we gathered at the bivouac, confident that the next day would bring us victory.

The return of light was welcome. Limbering up our aching bones, Siri, Wilson and I mounted the fixed ropes. At 10.00 A.M. Siri and I were at the top of the rope, with Wilson just below. While I gave a belay, Siri began to work on the 100-ft. crack that leads up to a gendarme near the summit ridge. Six hours and 18 pitons later, he reached a small ledge just below the ridge. Since there was room for all, Wilson and I joined him. This was the first chance to sit down since we had left the buttress. The rest of the time we had to remain standing, tied to the rock with pitons and slings.

Siri, exhausted by his labors, elected to go down; but Jim and I, choosing to chance a night on the summit, stayed to see what we could do before dark. A quick scramble to the ridge showed no route that way. Returning to the ledge, we traversed to the left, and Jim led up a sixth-class pitch which proved to be not so difficult

as we had expected. We were on the top at 5.30 P.M. and yodelled to inform the others that we had made it.

After congratulating ourselves and placing a register, we hurried back to the ledge and on down the fixed ropes. The next morning the rest of the party prussiked up the ropes and added their names to the register, while Wilson and I hurried up another slope to take pictures of them on top. By early afternoon we were all headed down the mountain, happy that we had finally conquered the great spire. PHILIP C. BETTLER

*North Wall of Sentinel Rock, Yosemite Valley.* The lure of the N. face of Sentinel began to be felt in 1936, when Morgan Harris, William Horsfall and Olive Dyer made a reconnaissance of the lower cliffs, hoping to find a route up the face. They ascended over easy fourth-class ledges to a sandy, tree-studded ledge 1500 ft. above the valley floor. This ledge, known as the Tree Ledge, lay at the foot of the N. wall itself, though still 1500 ft. below its summit. Here one could look up and barely catch sight of the small tree growing on top of the buttress that reaches up 800 ft. onto the wall. Beyond? No one could tell: this was one of the great mysteries stirring the ambitions of many climbers.

There was some activity on the wall in the Forties. Robin Hansen, Jack Arnold and Fritz Lippmann made several attempts and eventually reached a point some 150 ft. above the Tree Ledge. In the fall of 1948 Jim Wilson and Phil Bettler climbed another 100 ft. higher. In October 1949 a party (Wilson, Bettler, Bill Long and I) arrived at the Tree Ledge prepared to make the first bivouac on the face. We made about 450 ft. in over 20 hours' continuous climbing. The greatest difficulty during this attempt was the lack of a suitable ledge for a bivouac: the night was passed on a tilted chockstone—crowded with two people, more so with four!

Spring finally came, and May 1950 saw the successful ascent of the buttress. Long and Bettler, in a two-day ascent, reached the top and had the first look at the great chimney, a dark cleft that led the rest of the way to the summit. Their report was anything but encouraging. The chimney was inaccessible; it was fully 100 ft. to the left, with nothing but bare granite between. The only possible way was to go straight up, with bolts, and hope to enter the chimney higher up.

John Salathe and I climbed to the Tree Ledge on 30 June 1950, ready for another long siege. We carried 15 karabiners, about ten horizontal pitons, eight angle pitons and twelve expansion bolts plus hangers; we had also a 300-ft. rappel rope, a 120-ft. climbing rope and a 120-ft. hauling line (¼-in.) for the packs, which contained a little dried fruit and canned tuna. On top of all this, we hauled two gallons of water up the cliff.

Two days brought us over familiar ledges to the small cairn on the buttress: 800 ft., 14 leads (all partly sixth-class), over 80 pitons. Hard climbing, those two days. At one point, I felt quite ill and almost had to give up the climb; but a little water restored my strength, and we continued.

Late on the second day, Salathe started trying to get as high as possible above the buttress before dark. At the rate of four ft. an hour, he made 25 ft., using several pitons and bolts. There were a few cracks, some good and some—well, not so good. One piton turned 30 degrees with his weight on it, but he quickly shifted his position and averted a fall.

Early the next morning he was at it again, and in seven hours he was up and over the steep part. I prussiked up, and we discussed the next few leads. By this time the sun had come from behind the wall and was shining directly on our backs. Down in the valley temperatures up to 105° were recorded, and there was little wind to counteract the heat. We craved water, but had to be satisfied with an occasional sip. We knew that our water would not last long.

Using a tension traverse, we were able to climb into the chimney. But once inside we knew our troubles were really beginning. For a good 130 ft. the chimney was vertical, if not overhanging a bit. Toward the top of this stretch the walls came together and prohibited climbing on the inside—and there appeared to be no route on the outside. Here was the crux of the climb. To be frank, I may say that I was figuring out how we could rappel back over the route we had made and still make the horizontal distance back to the top of the buttress.

But we made our try and came through. I managed to scramble into an inner chamber of the chimney and thus gain a ledge directly below the narrow part. John, being too hefty to squeeze into the chamber, prussiked up to my stance outside the chimney. Taking the lead, he placed two pitons and then leaned out almost horizon-

tally, trying to reach around the corner. I saw the piton slip a little—and then hold. It held until he had reached around the edge and placed another in a small crack that eventually led up to a small ledge on the face. John yodelled happily, and I followed up. Although we did not know it at the time, the climb was ours. This particular stretch had looked impossible from below. A bit of luck led us to the right combination.

From this point on, it was an endurance test. Our water was low, and the sun was fiercely hot. We had long since ceased to sweat. I can remember many a time when I tried to call John, but could not because of my intense thirst. Down in the valley, painfully visible, was the cool Merced River! We longed for the land of beer counters and drinking faucets; we longed for a little damp moss to suck, or a root to chew—anything that was green or damp.

We were forced to spend another night on the face. Our third had been in the great chimney—practically a standing bivouac. This, our fourth night, we spent in an even less desirable place; but we had no choice.

On the morning of the fifth day we stood upon the summit. The climb had lasted four days and five hours. The 1500 ft. had required 25 leads, nine bolts and over 150 pitons. The last lead was an anti-climax: a fourth-class scramble, the only one of its degree on the entire wall. Our joy on reaching the summit was short-lived: the ordeal was not to be finished until we had run down the mountain-side and collapsed, fully clothed, in the little stream that rushes contentedly down the gully to the E. of Sentinel Rock.

The ascent was as successful as anyone could hope, and perhaps as singular. Sometimes it seems odd that such torment of the body should afford such satisfaction. John told me once on the climb that he was going to give up this sort of thing and take up back-country hiking. Just recently I heard that he was on the first ascent of Sugar-loaf Dome in Little Yosemite Valley. A good deal of sixth-class climbing there, with a bivouac thrown in for pleasure . . .

ALLEN STECK

### UNITED STATES: CLIMBS IN THE PACIFIC NORTHWEST

*Stein's Pillar, Oregon.* Stein's Pillar is a spectacular rhyolite monolith located in central Oregon. One reaches it by turning off

U.S. Highway 28 near the upper end of the Ochoco Reservoir, at a point about ten miles E. of the town of Prineville, and then following a gravel road for seven miles up the Mill Creek Valley. A visitor arriving for the first time need have no concern about identification of the Pillar. When it suddenly bursts into view around a bend, he *knows* that he has found it. Having once spent the better part of a day with a party of four in gaining 30 vertical ft. on its walls, I believe it to be the most incredible single pinnacle I have yet seen, with the possible exception of one or two sandstone spires in the desert regions of the Southwest.

On 18 July 1950 the first ascent was accomplished by a party of five climbers from Oregon City: Donald Baars, Leonard Rice, Russell Johnson, and Floyd and Glenn Richardson. They made the climb in three sessions, extending over a period of two years—a fact which gives some indication of the amount of work required. Pitons are of little use except near the bottom, because the spire is virtually without cracks. Progress must depend on extensive use of expansion bolts. The 400-ft. walls overhang on all sides to such an extent that the crest, according to the climbers, has an area half again as large as the base. The Pillar leaves a distinct impression of being upside down.[1]

FRED D. AYRES

*Middle Peak of Liberty Bell.* On the Memorial Day week end in 1950, Dick Widrig, Wesley Grande and I trudged through snow over most of the 16 miles of the Early Winter Creek Trail to Washington Pass, which is a few miles N. of Lake Chelan in the Cascade Mountains. Just S. of this pass are the three peaks that make up the main mass of Liberty Bell Mountain. The N. and S. peaks had been climbed; the middle peak, as yet untouched, was our objective.[2]

We approached the peak by the W. side and easily moved up to the base of the tower, where we considered possible routes up the remaining 400 ft. It was decided to work up the steep snow couloir that led to the col between the middle and S. peaks, even though it was cut about halfway up by a large rock cave or overhanging formation. This plan seemed at least possible, since the lip of the overhang was only about 40 ft. above the snow. Actually, this proved

[1] For a complete account of the climb, profusely illustrated, see the article by Donald Baars in the *Mazama Annual*, December 1950, pp. 27-33.

[2] G. Johnson, *Mountaineer*, XXXIX (1947), 49.

to be the bottleneck of the climb: only after practising an odd variety of climbing tricks were we able to force a passage up the partially ice-covered rock. I am sure that later in the year, when snow is not there to help, this route would be impracticable.

About 200 more ft. of the snow couloir brought us to the col, where we donned tennis shoes—necessary for the moderately difficult rock work ahead (200-300 ft.). Climbing was further complicated by a freezing wind and driving snow particles. On arriving at the summit, we hastily constructed a cairn. We then made a speedy descent to high camp, where several inches of snow fell that evening.

P. SCHOENING

*S. Face of Forbidden Peak.* Whoever ventures into the Cascade Pass area, in the state of Washington, can hardly help admiring the sharp ridges and sheer faces that lead up to the summit of Forbidden Peak (8900 ft.). These impressive features prompted a party of Seattle mountaineers to try an ascent, during the long Fourth of July week end in 1950. Previously, Forbidden Peak had been climbed three times—twice by the W. ridge used on the first ascent[8] and once by the E. ridge. We planned to tackle the S. face.

Dick Widrig and I, the first of the party to approach the problem, established a high camp at timberline, directly below the peak, and then hiked up the glacier at the base of the 800-ft. face. Here we met the first obstacle: the lowest 200 ft. of the face appeared to have been so cut back by the action of the glacier as to be vertical and even, in some places, overhanging. We negotiated this bit by attacking the face on its left side, at the edge of a chimney; and then, after passing the overhang, we worked out more on the face. Progress was slow and often tedious, but by the end of the day we had done more than half of the wall—a good start for the next day. We then retraced our route, which Fred Beckey and Bill Fix established more securely with additional safety devices and fixed ropes.

Since Fred and Dick had to return to Seattle that evening, Bill and I were left to carry through the proposed climb. Next morning we moved rapidly up the fixed route and, without much difficulty, reached the high point of the previous day's efforts—at the base of a chimney that led almost to the summit ridge above. Since this whole face is composed of high-angle "down" slabs, with hardly any natural belay stations, the use of safety and anchor pitons was

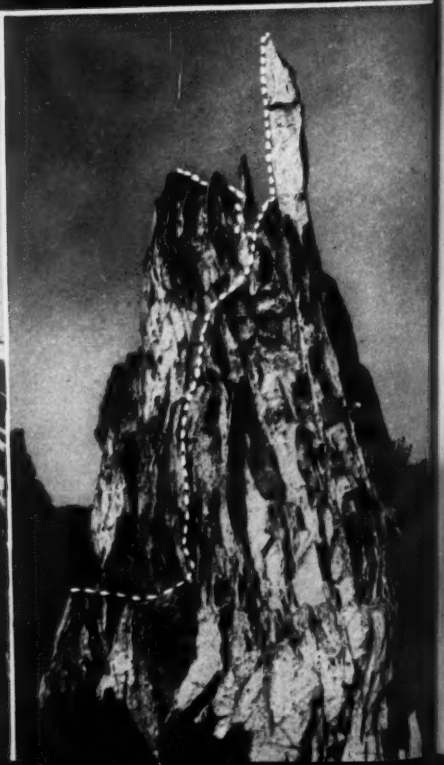
[8] L. Anderson, *Mountaineer*, XXXII (1940), 35.

*Photo, A. Steck*

SENTINEL ROCK

*Photo, F. D. Ayres*

STEIN'S PILLAR



almost a necessity along the entire route. Many of the belays were of a hanging nature. After exchanging leads several times, we finally arrived at a point some 60 ft. below the summit ridge where our chimney petered out in a jumble of overhanging cracks. After grunting for a couple of hours and using five aid pitons and an equal number of partial aid and safety pitons, I managed to struggle up about 30 or 40 ft. of the blockade. Bill then took over the lead and moved to the ridge. The summit was now 130 easy yds. to the E.—a satisfying sight, we thought, considering that it had been reached only after two days of fifth- and sixth-class climbing that required the use of 34 pitons, five of them for direct aid.

P.S.

*New Ascents in the Cashmere Crags.* Of a number of new climbs on the Nightmare Needles in the Cashmere Crags, the first of the 1950 season was the ascent of Cynical Pinnacle by J. Hieb, W. Fix, J. Schwabland and F. Beckey. An open chimney on the N. face proved to be the key to the route.

On June 10th Fire Spire, an impressive shaft crowning a sharp arête, was scaled by A. Holben and Beckey. From a notch at its northern prow, reached over several hundred ft. of broken granite, the traverse of a vertical wall is made with pitons and a doubled rope. Height was gained later by a series of slanting cracks, suitable for angle pitons, two of which were needed for direct aid. From a *cheval* belay on a tilted slab the final 15-ft. summit needle was climbed with the aid of a lasso.

Little Snowpatch, a spire which derives its name from a peculiar snow patch on the E. face, was climbed on June 25th by Hieb, Schoening and Beckey. The route to the snow patch was by a series of bathtub holds on steep rock. Then, from a shoulder stand, a spare rope was flipped behind a scrubby tree growing in a 60-ft. crack. The leader was able to negotiate the crack above the tree with the aid of four giant angle pitons of a homemade variety. The last lead, from a tiny belay stance, was up a rounded S. arête with delicate but adequate holds. Later in the day, the first ascents of Windjammer Tower and Westwind Tower were accomplished.

TOP: LIBERTY BELL MOUNTAIN
Left to right: South Peak, Middle Peak, middle spines and North Peak
BOTTOM, LEFT: LITTLE SNOWPATCH
BOTTOM, RIGHT: THE FLAGPOLE

Both required direct aid. On the latter, more giant angle pitons and a Rawl-drive contraction bolt were used.

One of the most bizarre needles in the Crags is a monolith S.W. of Enchantment Lakes. It has been known for some years as the "Flagpole." On the week end of July 16th, Schoening, Phil Sharpe and Beckey hiked seven miles up the Ingalls Creek Trail and climbed open forest slopes to a campsite at Crystal Lake, nestled among forbidding granite precipices. They devoted what was left of their first day to searching for a suitable approach to the Flagpole and to making the first ascent of Pennant Peak, which involved 500 ft. of climbing in sneakers. It was decided that the only practicable route was an exposed ridge traverse from Pennant Peak. This worked out well, except for a gendarme which could be bypassed only by a delicate traversing rappel—a route of no return. At the base of the final "pole," it was evident that any route would require 75 ft. of "engineering" on mainly vertical or overhanging rock. Accordingly, equipment was cached, and a fixed rope laid out down the steep cliffs of the flanking ridge, before the party returned to the lake. The final ascent on the next day was quite spectacular. Nine Rawl-drive bolts (¼-in. and 5/16-in. sizes) were used for aid, and one was used for safety and rappelling. One crack permitted insertion of three spade pitons for aid; and once, in a rounded fissure, an eight-inch angle piton was hammered in sideways and anchored well enough to support full weight. This enabled the leader to flip a noose over a ridge knob. The entire needle being of dubious stability, since it overhangs its base on all sides, the climbers spent no unnecessary time on the summit.

FRED BECKEY

*Other Climbs in the Cascades.* Cascade Peak, the last unclimbed peak in the Cascade Pass region, was ascended on July 23rd by Schoening, Sharpe and Beckey. From Gilbert, at the end of the newly-extended Cascade River Road, the party made its way through brush thickets and a rockslide to an ice couloir separating Cascade Peak from the E. flank of Johannesberg Mountain. Crampons facilitated the ascent of the 3000-ft. couloir. The only difficulty was at a bergschrund: the leader crawled up a thin lip from a shoulder stand. The final ascent to the summit (7500 ft.) was made in sneakers on the S. side. Loose rock was much in evidence. Hav-

ing sighted several apparently unstable séracs perched above the couloir on the Johannesberg wall, the party made a circuitous return by way of Cascade Pass.

On the week end of September 9th, Hieb, Schoening and Beckey flew with Ralph Widrig, in his plane, to the head of Chilliwack Lake, in a remote section of the Northern Cascades, just across the Canadian boundary. Middle Peak was found to have been climbed previously; but several other summits in the area—possibly unclimbed—were visited, and a good deal of reconnoitering was accomplished. To save weight, the party carried no sleeping bags. A bivouac fire proved to be adequate for warmth.

On October 15th the "Devil's Delight" route on the S. face of Castle Rock (Tumwater Canyon) was completed by Schoening, Grande and Beckey. One bolt and more than 20 pitons were used, most of them for direct aid on a 55-ft. overhang. The last 220 ft. went surprisingly fast.

F.B.

*Traverse of Mt. Index.* The grim precipices of the three peaks of Mt. Index, just S. of the Stevens Pass Highway, have long been a challenge to climbers. The S. (main) summit has several easy routes; but to the N. a steep cliff separates it from the middle peak, which is connected by a sharp, curving arête to the N. peak, looming directly above the highway. In August 1950, with special interest in the unclimbed middle peak, Hieb, Schoening, Dick Widrig and Beckey devised a plan for a traverse of all three peaks.

Early in the month, prepared for a two-day siege, the party ascended most of the 2400-ft. N. peak in sneakers, but halted when the weather began to threaten. On the week end of August 12th, only Schoening and Beckey were able to return, but these two found the skies clear. Having reached the summit of the N. peak about noon on the first day, they descended to the notch separating it from the middle peak by a series of short cliffs and winding ledges. A prominent gendarme was one of the chief obstacles. Another obstacle, farther on, was a steep wall rising out of the notch to the N. ridge of the middle peak. The first of two leads was the more difficult; it required four pitons for safety. The ridge to the false summit was long and had some delicate stretches, but it was less difficult than a traversing rappel off the first summit. From here

the middle peak was quickly accessible. Since evening was now approaching, the climbers picked a bivouac site, with an eye to the availability of water and scrub wood.

They passed the night watching headlights on the road 6000 ft. below, eating and dozing in the tentsack. From this point, next day, a rappel brought them to the notch beyond the middle peak. Here difficulties again became acute—this time unexpectedly. On a long, vertical lead, the leader had to place four pitons for protection. Soon the climbing eased a bit, although two precipitous heather slopes were awkward. Farther on, an exposed ridge crest gave some difficult belayed climbing, especially across some little gendarmes. Eventually the route worked right across a steep rock gully, up a broken face, around a hidden corner, and up a 100-ft. chimney. Shortly before 10.00 A.M. the route became a scramble, and the summit of the main peak was quickly attained by this new route.

F.B.

### United States: Climbs in the Tetons

*North Face of Cloudveil Dome.* Cloudveil Dome (12,026 ft.) lies on the ridge that connects Nez Perce and the S. Teton. Being situated on a ridge, it can be approached very easily from the E. and W. extremes. To the S. it drops abruptly for several hundred ft. into Avalanche Canyon. The northern side is a sheer wall facing the S. fork of Garnet Canyon. Most sensible climbers would consider the ascent of this wall impossible: from Garnet Canyon it looks smooth and overhanging. But early in the summer of 1950, scrutinizing the face from the top of Nez Perce, we noticed two ledges running up the sheerest portions of the precipice. It seemed to us that, if either of these two ledges could be reached, the face might very possibly be climbed.

On the morning of 22 August 1950, Paul Kenworthy and Richard Pownall, accompanied by Gene Schlichter, began the long trudge from the Petzoldt-Exum Mountaineering Headquarters at Jenny Lake up to Garnet Canyon. After breakfasting with Orrin Bonney and his son Roger, we continued up the canyon and branched off toward Cloudveil by way of the S. fork. By 10.00 A.M. we had reached the snow field at the bottom of the N. face of Cloudveil. Here we left Gene, who had come along to help us

carry equipment, to take pictures and to act as our support in case of emergency.

Kenworthy and Pownall approached the climb directly by ascending the steep snow field. The snow was hard, and the steepness gradually increased. The upper 200 ft. required step-cutting. Having crossed the schrund, we scrambled up a series of down-sloping ledges for 80 ft. before roping. Dick then led up an easy chimney (40 ft.), made a short traverse to the right onto a friction slab and then climbed straight up the slab to a ledge. The downward slope of the ledge, and the presence on it of loose rock, made a piton anchor imperative. Kenworthy scrambled up to the anchor position and led a traverse on rotten rock for some 80 ft. to the W. Then, anchored to a piton, he brought Dick over. We were now directly under the vertical portion of the face. We changed to sneakers and tied our ice-axes to our 70-ft. nylon line, so that we could haul them up.

Three attempts on a very steep but broken chimney proved vain. This had appeared to be a possible route for about 300 ft.; but the rock was vertical, and it had a down-sloping structure. Pownall was able to ascend only 30 ft. We decided to traverse back to the first anchor position and try to go up from there. Pownall made a 30-ft. traverse to the E. and then, by flipping the rope up and over a nubbin of rock, was able to make a tension traverse into the bottom of a very steep chimney. He climbed about six ft., drove in a piton for security and then continued up perpendicular rock for another 20 ft. before placing a second piton. Here he faced an overhang. The chimney ended. Some ten ft. higher, there was an anchor position. Pownall delayed a few moments, resting, and then went slightly to the left and directly over the eight-ft. overhang to a sloping ledge where he anchored to a piton. The axes having been raised, Kenworthy ascended on a belay.

We believe this pitch to be the key to the climb. To the right, the rock was very sheer and smooth; to the left (E.), it would have taken us off the face and onto the E. ridge. We were now in the middle of the face and able to reach the black chimney from which we could traverse to the higher of the two ledges we had observed from Nez Perce.

The next lead, on easy rock (120 ft.), brought us to the first large ledge. We continued upward, slightly to the right, for another

full rope-length. Now, right under the large outward bulge of the face, we found that we should have to traverse at least a full rope-length to the W. in order to reach the ledge which (we hoped) would take us to the top. The outlook was very bad: rock very smooth and quite steep. Paul anchored to a chockstone. Dick started up a ten-ft. layback and then essayed a very touchy traverse to the right. Having completed this, he climbed ten ft. up a broken face to the foot of a chimney, where he secured a sling with karabiner to a nubbin of rock. He then proceeded 60 or 70 ft. up the chimney before anchoring to a large flake. Here Paul belayed Dick while the latter descended about ten ft. and then climbed a crack (20 ft.) to a smooth granite slab. Now a direct traverse to the W.—90 ft. on very exposed rock—required the utmost balance and precision of movement. Two pitons were used for protection.

We now attained a fairly large shelf directly opposite the broad, up-sloping ledge which leads to the top of the face. The bottom portion of the ledge sloped at about 75 degrees; the upper portion seemed to be at an easier angle for climbing. Pownall went about 60 ft. up the ledge and then decided that it was no good: steep, loose rock, without piton cracks, and decidedly exposed. We descended and started up a narrow right-angle chimney which joined the ledge about one-third of the way up. This chimney was broken at about the halfway point, where the upper and lower portions were separated by a ten-ft. overhang. Two pitons were used for the overhang. The complete lead was 120 ft.

At the top of the chimney Dick had to tie in to one piton and use another, with a karabiner, to belay Paul. Since there was room for only one person at this stance, Paul anchored about 30 ft. below Dick, and Dick led out on the face of the broad ledge about 90 ft. to a more secure position. One piton was used on this lead. The rest of the ledge offered no technical difficulty. In a matter of minutes, we were standing on the top shoulder of the N. wall which adjoins the large overhanging portion on its right flank. We unroped and scrambled to the summit. The time was 6.45 P.M. We gobbled such food as we had, changed to boots and descended by the regular route. The effort expended in hauling axes up the face was counterbalanced by a good glissade of some 1200 ft. By 7.30 P.M. we were back in Garnet Canyon.

There had been one or two unpleasantnesses in the climb. Having

started about three hours too late, we were in the shade almost the whole time, and felt cold at times. Drawing the axes up on the nylon line was sometimes rather difficult and time-consuming. We suggest that future parties arrange to have axes and boots carried to the summit by an easier route. But the rock is sound and enjoyable. It is a very good technical rock climb. And we do recommend it to experienced climbers who are looking for routes of more than moderate difficulty.

N. P. Kenworthy, Jr.
Richard Pownall

*New Routes on Symmetry Spire.* In July 1949 Lee Pedrick and Richard Pownall made the complete ascent of the conspicuous crack which runs directly up the S. wall of Symmetry Spire (10,546 ft.). Previous attempts had been made by Fritz Wiessner, who encountered bad weather, and by Robin Hansen and Fritz Lippmann, who in 1945 traversed to the left (S.) under an overhang near the top of the crack and finished their climb on the ridge to the left (Durrance-Spofford ridge). Pedrick and Pownall made the complete ascent in eight hours, using 15 pitons. The rock is very sound and calls for a variety of climbing techniques. Predominantly vertical, the climbing attains a climax at the overhang already mentioned. A ten-ft. section near the top of the overhang demands the nicest of friction-balance climbing. Pedrick led this pitch—rather short, but sensational. A fixed rope has been left here to aid future parties. To date, the route has been ascended five times. It has been given the name of "Templeton Crack," in honor of Mr. and Mrs. Harvey Templeton, who were the first to be guided on it by the Petzoldt-Exum Guiding Service.

Also in July 1949, Pownall, Red Austin and Art Gilkey made the first ascent of the N. chimney—the very large, black chimney which, as seen from Jenny Lake, runs three-quarters of the way up the N. wall of Symmetry Spire and eventually, a few hundred ft. below the summit, separates the N. shoulder from the N. face. The only difficult pitch (30 ft.) was about 100 ft. up the chimney. Two pitons were used here. R.P.

*New Route on Storm Point.* The first ascent of Storm Point (10,040 ft.) by the S.W. ridge was made by Art Gilkey and Dick

Pownall in August 1949. The approach is by the Cascade Canyon trail. Roped climbing begins at the very base of the ridge, only a few hundred ft. off the trail. It is a long climb, on sound rock, with pitches of varying difficulty. Gilkey and Pownall spent seven hours on the ridge and used 12 pitons for safety. The very first pitch was one of the hardest. The route is a good one for large parties, as there are many points from which, by a short traverse to the W., one can reach a large couloir that gives easy access to the saddle between Storm Point and Symmetry Spire.

R. P.

*Variation on the Grand Teton.* During August 1948 Dick Pownall and Art Gilkey established a new route on the Grand Teton. This route branches off from the regular (Owen) route at the upper saddle; it begins with a traverse to the S. on a rather broad ledge which begins at the base of the Wittich Crack. After the 150-ft. traverse, the route ascends a series of three ten-ft. faces, terminating on broad ledges. Once up these faces, one has an easy walk to the Exum Ridge. The climbing is easy but somewhat exposed. The route provides a good alternative for parties turned back by ice on the Owen route.

R. P.

*Grand Traverse.* During July 1950 Mike Brewer and Dick Pownall completed the longest traverse ever made in the Tetons. They started at midnight from Jenny Lake and ascended five major peaks, in this order: Nez Perce, Cloudveil Dome, S. Teton, Middle Teton, Grand Teton. Regular routes were used on all peaks, except for the descents of the Middle Teton (N. ridge) and the Grand Teton (E. ridge). The summit of the Grand was reached at 2.30 P.M., 14½ hours from Jenny Lake. Hazardous snow and ice conditions on the E. ridge of the Grand slowed progress. It was not until 7.30 P.M. that the climbers reached the Grand Teton Glacier—too late to carry out their original plan to include Owen and Teewinot. The longest previous traverse was accomplished in August 1946 by M. McLane and J. Snovel, who ascended the Grand, Middle and S. Tetons. In July 1938 H. Butterworth and J. Durrance traversed from the S. Teton to the Grand.

R. P.

*First Ascent of Red Sentinel.* The Red Sentinel, a very spectacular 200-ft. spire rising abruptly on the ridge which joins the W. wall of Disappointment Peak, was scaled for the first time in July 1950 by Mike Brewer, Dick Pownall, Bob Merriam and Leigh Ortenburger. The last attempt on this very sheer pinnacle had been made in August 1947 by Hans Kraus, Don Brown, Adolf Snow and Haldon Smith. This party had made 20 ft. of direct-aid climbing on the N. face and then stopped, within 30 ft. of the top, under a pitch that they reported as being not only vertical but smooth and devoid of piton cracks. The 1950 party ascended a steep 60-ft. jam crack on the S. face and then made a tricky friction traverse (60 ft.) on high-angle rock to the knifelike E. ridge. From there they completed the ascent by sensational rock climbing on the perpendicular N. wall. A vertical 60-ft. pitch, with minute hand- and footholds, led to the top of the E. ridge. Thence a 60-ft. scramble took the party to the summit —or rather to the highest point on the sharp summit ridge. Descent was by a 120-ft. rappel down the vertical and overhanging N.W. side. Pitons were used for protection only.

R. P.

### United States: Activities of the Clubs

*A.A.C., Cascade Section.* As usual, the Section enjoyed an active year. Several members attended the annual outings of the A.C.C. and the Mountaineers at Mt. Robson. Fred Ayres and Don Woods made a number of fine ascents in the Canadian Rockies and Cascades; Fred Beckey continued his exploration and climbing in the Cashmere Crags; Robert Craig had a successful season as manager of the Mt. Rainier Guide Service, which took 60 people to the summit;[1] Dr. Peter Misch and Dee Molenaar made several ascents in the Northern Cascades during a two-month period of geological reconnaissance and mapping under a grant from the Geological Society of America. Four members are now permanently employed on the ranger staff at Mt. Rainier National Park: Gordon Patterson, Elvin Johnson, and Cornelius and Dee Molenaar.

The Third Annual Pacific Northwest Mountaineering Conference was held at Paradise on 9 and 10 September 1950. In attendance were representatives of the National Park Service, Forest Service,

[1] The number of independent climbers who reached the summit during the summer of 1950 was 170.

Coast Guard, Ski Patrol, Mountaineers, Mazamas, Washington Alpine Club and A.A.C. Interest was focused on search-and-rescue problems and on the newly-developed "sliding middleman" technique.

The Section's Annual Banquet was held on 4 November 1950, on the campus of the University of Washington. After dinner, the 35 members and guests saw colored slides of recent trips. John Hossack was elected chairman of the Section for the coming year.

D. MOLENAAR

*A.A.C., Sierra Nevada Section.* Since its organization in March 1947, the Sierra Nevada Section of the A.A.C. has held occasional meetings in the San Francisco Bay region. Recently, the increase of activity has created a need for regular quarterly meetings. Attendance at these meetings has averaged about 20 members—which shows excellent interest as eleven of our 46 members reside in southern California. The present officers are Einar Nilsson, chairman; Glen Dawson, vice-chairman; Oscar A. Cook, secretary-treasurer; David R. Brower; and Richard C. Houston.

In addition to concern for general club affairs this Section's members are strongly in favor of (1) the reactivation of the A.A.C. committee on military mountain and arctic training and equipment; (2) guarding against any further granting to the National Park Service and other Federal agencies of authority to prohibit climbing; (3) some program to disseminate information on safe climbing technique that would reach prospective young climbers having no regular club affiliation; (4) Will Siri's research program on the forces involved in belaying and their physiological effects on the human body; (5) Oscar A. Cook's proposal for some sort of late summer outing or meeting which would serve to bring together A.A.C. members from all parts of the country. It was felt that a week's stay in some good mountain area of the western United States or Canada would be suitable. Furthermore, the Sierra Nevada Section is willing to serve as host at the first such meeting, with the hope that other sections would follow its lead and offer to take charge in other years.

California climbers celebrated their state's centennial by accomplishing major ascents in their own state and British Columbia. Mt. Waddington was climbed by two new routes by an expedition

organized by five members of our Section: Cook, Houston, Allen Steck, Philip C. Bettler and James Wilson, who invited their Sierra Club contemporaries, William Long, William Dunmire and Raymond de Saussure, to join them. Members of this expedition also participated in the following first ascents: the Rock Tower of Mount Waddington, Point "W," Point "A," "The Don," Mount Munday (these four all by the N. face of the Munday massif), "Campbell Peak," "Lichen Pinnacle," "Snow Dome," "Mount Roger," "Mount Ferris," "Mount Irresistible," Mount Grenelle, Mount Fascination, "Sierra Peak," Mount Merlon, Mount Marcus Smith, Whymper Dome, "Mount Jeffery," East Claw Peak, Mount Stiletto, Serra II, Serra III, "Photo Point."

John Salathe and Allen Steck made the first ascent of Yosemite's Sentinel Rock by its sheer N. face. This, undoubtedly, must be considered as one of the outstanding rock climbs in the history of the sport. By Yosemite standards, it is comparable only with the Salathe-Nelson route on the Lost Arrow. Bettler, Wilson and Steck, together with Long and Siri, made the first ascent of Castle Rock Spire in Sequoia National Park. These two climbs culminated several years of attempts by these and other strong parties. On another recent Yosemite climb, Cook led Dunmire and Robert Swift on the first ascent of the Spires' Buttress N.E. Chimney. Clyde Minaret was climbed for the first time in the winter by Wilson, Steck and Long.

OSCAR A. COOK

*Mazamas.* The Mazamas, Portland, Oregon, continued their regular program of official climbs, local walks and Wednesday evening clubroom programs during the year 1950. The climbing committee conducted a pre-season climbing school for ten weeks during the spring, with practice trips to provide experience in both rock and snow climbing. Safety was emphasized throughout the course. The ski committee conducted a ski ascent of Mt. St. Helens in May, with all the ten participants reaching the summit. The lodge committee was particularly active in improving and repairing the massive club lodge on the lower slopes of Mt. Hood. The 57th Annual Outing was held in the Olympic Mountains of Washington, from July 15th to 30th. A late spring, coupled with a heavy snow cover remaining from severe winter storms, necessitated use of an

alternate route by the packers; and the main camp was finally established in the Elwha Basin at an elevation 1000 feet lower than had been planned. These initial troubles were more than compensated for by an almost unprecedented stretch of fine weather during the camp period proper. Farther afield, Mazama William D. Hackett reached the top of Kilimanjaro, Africa's highest summit, on 10 February 1950, and of Mt. Kenya on 17 February 1950. Hackett climbed Mt. McKinley in 1947 and Aconcagua in 1949.

FRED D. AYRES

*Colorado Mountain Club.* "All aboard for the Great South Circle Trip! Great North Circle Trip and Hall's Spires leave tomorrow at 7:29 A.M. promptly! Mt. Bonneville on Thursday, rain or shine." No, not the announcer at Grand Central. This comes from the 37th Annual Outing of the C.M.C., held in the Wind Rivers of Wyoming from 22 July to 6 August 1950. Some 60 members and guests were there, from points as far away as Rochester, Baltimore, Pittsburgh, Chicago, Ohio and California. In age, they ranged from 15 months up. A fine camp—typical of the Club's efforts to pioneer new areas—was established on Middlefork Lake. Floyd Bousman did a masterful job of guiding and packing up the 20 rugged miles from his Boulder Lake Ranch. Interesting glaciated terrain, plenty of walks, more than plenty of fish—added to menus already meant for gourmands. The outstanding climbs were of Mt. St. Michel, Mt. Bonneville, and N. and S. Clefts (first and second ascents).

Every week end from April to November, the Club walked and climbed all over Colorado's peaks—"hours of exercise" for some 2200 people on 80 trips. It was a busy year and one of the safest, with more climbing done by more people, and no accidents on Club trips. This record is attributed to constant vigilance, to classification of members (which induces most to undertake only climbs within their powers), and to the "Technical Climbing School." About 150 attended the classes, and 225 the trips, which were held, as last year, in April and May. The Beginning School was scheduled after the Advanced School, so that both could not be taken in the same season. Also, it was hoped (not in vain) that the advanced group would produce some leaders and instructors for the beginners. For those interested in mountain walking, a "Learn to Hike School"

was inaugurated during the summer. An evening program that illustrated proper equipment and its use was offered to an audience of nearly a thousand. Subsequently, there was a supervised "hike," under special leadership.

The winter program was also full. Ski and snowshoe trips, between December and May, attracted about 675 participants. The Winter Outing was held in April, as scheduled, at Naylor Lake near Georgetown; but an unscheduled early thaw precluded ski climbs of Mt. Evans and Bierstadt Peak. For the first time in winter, the C.M.C. used an air drop for supplies, supplementing with fresh frozen orange juice, etc., the stocks that had been cached at the cabins during the fall. The winter safety program continued, with a showing of the new Forest Service film, "Avalanches to Order," and classes in first aid given by Red Cross-C.M.C. instructors.

Members in smaller parties climbed in many areas. A new route, "The Window," was worked out on the E. face of Longs Peak (*Trail and Timberline,* Feb. 1951); and a snow and ice route, done perhaps only once before, on S. Maroon Peak. Some climbed in the Tetons; two or three parties climbed in Mexico; two members climbed the Devil's Tower. Two members were in Canada, part of the time with the A.C.C.; they climbed Columbia and made two attempts on Mt. Robson. Two other members were in the Adamant Group, where they made first ascents of Black Widow and an unnamed peak which they called "Dortan"; second ascents of Gog, Colossal and Yellow; and third ascents of Damon and Pythias and Pioneer, on which they found Palmer's original record.

Under the editorship of Robert Ormes, work on the guidebook is progressing. The hope is that it will be published in the early summer. Plans call for inclusion of geological and historical notes, to make the book more readable—more than just a climbing guide to the high peaks of Colorado.

EVELYN RUNNETTE

*Iowa Mountaineers.* In 1950 the Club enjoyed its largest membership—1322. The budget permitted purchase of essential new equipment, including a Club bus of special design and two 16-mm. cameras. Five 16-mm. color films of Club expeditions were edited and added to the library: "Sawtooth Wonderland" (2600 ft.), "Ascent of Devil's Tower" (1400 ft.), "Climbing in the Wind Rivers" (1600

ft.), "Climbing in the Pacific Northwest" (2300 ft.) and "Climbing in the Canadian Rockies" (2900 ft.). The clubhouse was redecorated, and provision made for the housing of guests. Two lounge beds were installed, shower and rest-room facilities being already available in the dormitory immediately behind the clubhouse. Climbers travelling across the country are invited to stop off.

The mountaineering classes and popular Sunday travelogues continued. A journal, published in November, included over 75 photographic engravings; and the bi-monthly bulletin was increased in size from four to eight pages.

The Summer Outing of 1950 was in the Canadian Rockies, in the month of August—a nine-day base camp at Lake O'Hara, and a five-day tour along the Banff-Jasper Highway. Forty-two members participated, and five major peaks were ascended. Guides included John Ebert, Ken Jones, Bob Merriam and Ernst Feuz. Domestic and international conditions permitting, the 1951 expedition will be to Mt. McKinley Park in Alaska.

It has become evident, during the past year, that the Iowa Mountaineers are influencing the lives of the students and the staff-members at the University of Iowa. Records show that over 25% of the faculty and staff, and 10% of the student body, are members of the Club. Even more impressive is the fact that, after association with the Club, students have changed their majors to geology or forestry. For example, last summer two graduate students who had been formerly enrolled as majors in engineering and commerce were conducting research in the Wind River Range and on the Columbia Ice Field. Twenty student members registered for geology field trips during the summer, and twelve majors in physical education served as counsellors in mountain recreational camps. Other students, owing to their training with the Club, obtain profitable work during the summer months. Last summer, two of our climbers served as assistant guides for Glenn Exum and Paul Petzoldt in the Grand Teton National Park; and another directed Floyd Wilson's Gannett Peak camp in the Wind Rivers. Many other members were employed in the National Parks and Forests. It seems fair to assume that most of these student members would be in other fields of activity were it not for their affiliation with the Iowa Mountaineers.

S. John Ebert

*Chicago Mountaineering Club.* Members were active in several mountain ranges during 1950. A Club party of 13 camped at Lake Isabelle, in the Arapaho group of the Colorado Front Range, from July 31st to August 10th, and climbed all the major peaks accessible from their camp. Members participating in the summer outings of other clubs made ascents in the Lake O'Hara, Maligne Lake and Mt. Robson sections of the Canadian Rockies, the Lyell-Ritter group in the Sierra Nevada, and the southern Wind Rivers. Other members climbed in the Tetons and the Alps.

Local activities included nine lectures on mountaineering subjects and seven excursions for rock-climbing practice. One winter outing was devoted to practice in ice climbing. During the spring a group of members completed Red Cross standard and advanced courses in first aid under the instruction of Harry Lumby.

JOHN FRALICK

*Appalachian Mountain Club.* The Club had a full program of meetings, lectures and trips during 1950. Rock climbers were very active: many of the chapters did more along this line than in the past. White-water canoeing was promoted with considerable enthusiasm: again, the chapters saw the greatest growth. In addition to the usual list of trips during the canoeing season in the spring, a summer trip was run to the Rapid River in Maine, site of the 1940 and 1941 National White-Water Championships; and a summer trip through the Rangeley Lakes was conducted in August. The 1950 August Camp was held, for the first time in many years, in the Green Mountains of Vermont. The site at Warren, Vermont, was central and not far from the Mad River Glen ski development on General Stark Mountain.

The Club is looking forward to celebrating its 75th anniversary in 1951—the oldest mountaineering club in the United States. A cumulative index to Volumes XI to XXV (1905 to 1945) of *Appalachia* will be published; and two trips to distant regions are being planned—one to the English Lake District, and the other to the San Juan Mountains of Colorado.

KENNETH A. HENDERSON

*Potomac Appalachian Trail Club.* The principal activity of the P.A.T.C. during 1950 was the maintenance of trails, closed shelters

and open lean-tos along sections of the Appalachian Trail in Maryland, Virginia and Pennsylvania. The broader interest of members in climbing was recognized when the Club renamed the Rock Climbing Committee as the Mountaineering Committee. Regular Sunday climbs on local rocks provided instruction for beginners and practice of all degrees of difficulty for experienced climbers. Safety has been emphasized in all training, and also in field and laboratory tests of climbing equipment. A recently completed drop-tower allows free fall of a weight from 20 feet above to 20 feet below a belayer. The fall of a leader from above the belayer can be simulated, and the resulting stresses on equipment and climbers can be studied under controlled conditions. Publications issued during the year included a *Bulletin of Hiking, Camping, Mountaineering and Trail Clearing Equipment,* with a section on technical mountaineering equipment. The Club continued its series of lectures. Members participated in expeditions to the Wind Rivers of Wyoming, the Bad Shots in the Southern Selkirks and the Windy and Adamant groups in the Northern Selkirks.

ARTHUR C. LEMBECK

*Princeton Mountaineering Club.* The Club finished in June 1950 a fairly active year—its first as a separate entity in the university. The renewal of the academic year in September found no decrease in interest. During the summer members had climbed in the American and Canadian Rockies and in the Alps. As usual, the Tetons proved to be especially popular. This year climbs are being scheduled from one to three times a week, at the Delaware Water Gap and in near-by quarries, to give practice in rock-climbing techniques and train climbers to teach as well as lead. Two trips to Mt. Washington have been made, and a spring trip to Katahdin is tentatively scheduled. A series of lectures is being planned for this year, with emphasis to be placed on mountaineering safety; and a bulletin will be published, later in the year, to report the Club's activities.

NICHOLAS CLIFFORD

*Yale Mountaineering Club.* In 1950 the Club continued its program of training in rock- and ice-climbing techniques, with emphasis on the fundamentals of safe climbing. Members made numerous

trips to the Shawangunks and New England cliffs, and climbed weekly on Mt. Carmel. Winter activities included lectures, movies and ski climbs in the Adirondacks. During the spring vacation, the annual trip to Mt. Washington for ice-climbing was held. With the coming of summer, Yale climbers headed for distant parts. One group of three travelled south to Popocatepetl and the Sierra Madre Occidentales. Two members returned to Alaska, for work with the Juneau Ice Field Research Project. Others climbed in the Rockies and Cascades, and still others were as far afield as Switzerland and Sumatra.

EARL R. MOSBURG

*Harvard Mountaineering Club.* The summer activities of the H.M.C. in 1950 included the ascent of Nevado Yerupajá, Peru, by the Harvard Andean Expedition; and an expedition into the Glacier Circle area of the southern Selkirks, which made ascents of Mts. Fox, Selwyn, Wheeler and Kilpatrick, and Hasler Peak, as well as Mts. Rogers and Swanzy. Members also climbed in parties in the Alps, the Cascades, the Wallowas (Oregon) and the Sierra, and in the Teton, Wind River and Front ranges.

During the weekly Sunday rock climbs of the fall, the Club has taught the fundamentals of safe mountaineering to a great many new members. Frequent winter ice-climbing trips to Mt. Washington have given members much of the valuable snow and ice experience for summer expeditions.

Because of the large number of new members, the H.M.C. has established an active safety committee which has set up a Red Cross first aid and mountain rescue course, held discussions at the regular club meetings of the accidents described in the A.A.C. safety reports, and made clear the requisite qualities for good leadership. *Harvard Mountaineering* will appear in May, with an index to the first ten volumes of the journal.

TOM NEVISON

*Dartmouth Mountaineering Club.* Last fall the D.M.C. sponsored a six-week course in rock climbing. Most of the participants were members of the Club or candidates for membership, but instruction was offered to any student who wished to satisfy the college requirement in physical education. Seven student members

of the Club served as instructors. The class was divided into small groups which studied technique on pitches of increasing difficulty. Members were well grounded in principles that they will be able to apply on climbs during the summer.

In winter members of the Club have the opportunity to attend classes sponsored by the Dartmouth Outing Club. The following problems are dealt with by the college arctic specialists and by guest speakers: clothing, equipment, forest camping, weather, diet, winter mountaineering, first aid, maps and navigation, use of machinery in cold weather, snow and ice operations, and air operations. Classes are held once a week and are supplemented by practical problems.

Last summer members climbed in Wyoming, Colorado and Mexico. Two ascended Devil's Tower. Trips to Mt. Washington and Katahdin are planned for the spring of 1951, and a trip to Alaska is being considered by two members.

JERRY MORE

*Williams.* In 1950 the Williams Outing Club has continued its mountaineering activities along the lines set in 1949. Several members climbed in Colorado and Wyoming, and in the Canadian Rockies. The Club has shown a film on rock climbing in the Alps and plans to hear Adams Carter lecture on the Nanda Devi expedition of 1936. Members have had several local rock climbs and expect to make at least two overnight trips to New Hampshire during the spring of 1951. On the single winter trip, a party of six succeeded in climbing Mt. Marcy.

JOHN B. HEWITT

*Rensselaer Mountaineering Club.* Fortunate in having lost a minimum of leaders through graduation, the R.M.C. has been able to expand its activities greatly during the past year. Membership has doubled, and attempts are constantly being made to interest freshmen in mountaineering. A special one-year program of instruction utilizes the excellent climbing terrain at Grafton, New York, and in the Shawangunks. Practice climbs are supplemented by a series of lectures and films at which safety measures are strongly emphasized.

Continued interest has been shown in winter mountaineering in the Adirondacks. The Mt. Colden dyke was ascended in March

1950, and late last fall stores of food and equipment were cached in various lean-tos for use this winter on similar expeditions. During the summer of 1950 members made ascents in the Wind Rivers, Tetons and Cascades. In the East climbers pioneered a new route on the cliffs at High Chapel Pond, in the Adirondacks. This spring the primary goal of all R.M.C. members is to complete experiments, at the near-by Grafton Cliffs, with the dynamic belay.

RICHARD BAILEY

*Stanford Alpine Club.* The Club has weekly practice climbs on local rocks. Beginners are instructed in safe climbing, and more experienced climbers try to perfect their technique. Members frequently practise the dynamic belay by dropping a 120-lb. dummy from a tall tree. The fall is held through a pulley. Everyone must practise holding free falls of up to 20 ft. without jerking the dummy to too sudden a stop.

The Club has 50 active members, of whom about 25 usually turn out for a practice climb. The only new ascent made by the Club during the past year was a climb of Mt. Clark in Yosemite Park by three members and a member of the Sierra Club. This was a first winter ascent of the mountain. The climbers had a two-day ski trip to its base.

MAXINE STEINEKE

## ALASKA-YUKON TERRITORY

*Mt. Logan: Second and Third Ascents.* On 17 June 1950 Norman H. Read (aged 60) and André Roch, well-known Swiss climber, made the second ascent of Mt. Logan (19,850 ft.). Read, with five others, had made the first ascent on 23 June 1925. Three students from the University of Alaska, G. Herreid, A. Paige and C. Christensen, reached the central (highest) summit nine days after Read and Roch.

Read and Roch flew in from Cordova and landed on the Ogilvie Glacier at about 7000 ft. Camping near the site of the 1925 base camp, at about 8000 ft., they waited two weeks, in broken weather, for more food and supplies to be flown in. The air drop turned out to be not very successful: most of the supplies were scattered in soft snow, over a wide area, and quickly covered by a fresh snow fall. Despite the losses and shortages, Read and Roch were determined to make the ascent if they possibly could. Encountering weather

and temperatures not quite so severe as those experienced in 1925, they did attain the central peak—highest of the three. They were able to confirm the opinion of the 1925 party that the E. peak is lower by perhaps 100-200 ft.; but, owing to extreme shortage of food, they could not go over the two miles to climb it. [In August 1949, flying at 14,000 ft. a few miles from the summit mass, Wood and Hall likewise came to the conclusion that the E. peak is a little lower than the central peak.]

When Read and Roch returned to their base camp at the head of the Ogilvie Glacier, they met the three students. One of their party had just been rescued from a deep crevasse with the help of one of Read's party staying at the camp. Read reports that the students told him that without this aid they would have been unable to rescue their man. Read told the students that they could follow what was left of his tracks, and that they were welcome to any of his supplies which they could find. Read and Roch walked down the Ogilvie, Logan and Chitina Glaciers, and flew out from a hastily smoothed-off landing strip on the Chitina gravel flats near the 1925 Hubrick's Camp. According to Read, the ensuing two to three weeks, during which the three students made their climb, provided the finest weather he had ever seen in Alaska.

Herreid, leader of the students, had also led a party up Mt. McKinley in 1947, following in Washburn's tracks and benefiting by knowledge that some of Washburn's supplies would be found on the way. Herreid has thus become the first man to have climbed the two highest peaks in North America. He was fortunate in having extraordinarily good weather conditions on both ascents. It is to be hoped that he appreciates the vast difference between his experience of following on the heels of immediate predecessors, in the same season, and the experiences of the pioneering parties—Stuck's and Karstens' three-week struggle with the earthquake-shattered ice and névé ridge at 13,000 ft., for example, and the long journeys of approach to both McKinley and Logan. The airplane has greatly reduced and simplified the labor involved in these two ascents. Once the route has been found, neither of them involves very much technically difficult climbing. The chief requisites are knowledge of Alaskan glaciers, proper food and equipment, and the willingness to take some buffeting by the Arctic.

H. S. Hall, Jr.

## Canada

*Coast Range.* In addition to making two brilliant new routes on Mt. Waddington in the summer of 1950, the Oscar Cook-Richard Houston Sierra Club party made a number of other important ascents in this area. On July 23rd Dunmire, Wilson and Cook, with the aid of six pitons on one exposed pitch, climbed the S.E. Rock Tower of Waddington (12,900 ft.). Spearman Peak (11,000 ft.) and Whymper Dome (7000 ft.) fell easily, but the N. face of Munday (11,500 ft.) afforded a struggle. All five peaks of Munday were climbed, and on one of them Don Munday's original register was discovered. Full of vigor, the party went on to ascend Grenelle and Fascination (the latter by both the N.E. arête and the N. face). A peak between Merlon and Grenelle was labelled Sierra and also promptly scaled.

After troubles with a large falling rock and a bergschrund, the party, now camped below Merlon, ascended this peak by the S.E. and S.W. chimneys before a storm struck. Several days later the party split in two and from new camps climbed Mt. Jeffery by the long S. arête, and Marcus Smith from the S.E. The latter required 12 hours of climbing on the final day. Long, Steck and Bettler now climbed Stiletto and found fourth-, fifth- and sixth-class climbing along the E. edge of the N. face. Next day the same trio attacked Mt. Serra on the climb that Bettler describes as follows:

> Today we were headed for Mt. Serra, hoping to conquer one or two of its five peaks. We elected to try the snow couloir between the north faces of the third and fourth peaks (Serra 3 and Serra 4, counting from the west). Chopping steeps up over a vertical lip of the bergschrund, Bill Long led over hard snow and ice, cutting steps all the way. One hundred feet up, Bill placed an ice piton and belayed me to him, then continued for another 100 feet till he gained the rocks at the saddle. All this time Al waited patiently below, enduring the rain of chips which swept down the 55-degree slope in our wake.
>
> From the saddle we scrambled up the ridge toward Serra 3 (to the west). The way was blocked by a huge gendarme which, after an unsuccessful attempt to turn to the right, we by-passed by climbing down and around with a series of chimneys and a finger-tip traverse. From there it was a romp up to the final summit block, where a safety piton was used to help overcome a vicious looking, but not too difficult, ice-

covered pitch, in which the holds were discovered only by beating away a sheath of ice.

Pausing to place a register, we retraced our route to the saddle and went on to Serra 4. A few feet of scree brought us to an 80-degree face, where one piton was sufficient to protect the leader up a crack. Above this an easy friction pitch led to the summit ridge, where 30 feet *à cheval* along the ridge put us on top. We placed another register and stayed a while to ponder over the magnificent scene of Waddington and her consorts.

Back in camp we cooked supper and settled down for the night to dream of Serra 2, the highest of the group and as yet unclimbed. We had scouted the route from Serra 3 and were sure that it would go, but morning brought with it the predicted storm. It raged around our lonely tent for three days, discouraging all thought of venturing onto the peaks. By the time the storm had blown itself out it was August 16th, and the rest of the party was due to meet us in preparation for the trip back to civilization.

Backpacking and bushwhacking brought the party out to Tatla Lake where wheeled transport is available. A remarkable fact about this remarkable party is that the entire eight-week trip, with air drop, flight in, food, equipment and transportation to and from San Francisco cost only $165 a person!

*Garibaldi Park.* The highest peak in Garibaldi Park, 50 miles N. of Vancouver, was climbed in September 1950 by a group who reported rotten rock and treacherous snow. The 7500-ft. summit was reached after a 16-hour climb from a camp at 5500 ft. Another party was turned back 200 ft. from the top of the westernmost peak of the group.

### Central America

*Casualties on Popocatepetl.* About 5000 persons attempted the ascent of Popocatepetl on the week end of 15 October 1950, hoping to attend a religious ceremony in which the banners of mountaineering clubs in North and South America and Europe were to be blessed. They encountered a severe snowstorm. According to an Associated Press dispatch, three deaths and over 400 injuries resulted. Only 300 of the party reached the summit. Since the priest was not among them, the mass had to be cancelled.

## Europe

*"Felix qui potuit. . . ."* What seems to have been the most widely reported Alpine ascent in 1950 was made by a cat. "C'est un chat comme tous les autres chats," writes "Z." in *La Cordée* (March 1951), "un matou de 8 mois, noir et blanc, assez fort pour son âge." In August he followed a party to the Hörnli Hotel and took up residence there. Shortly after September 1st he set out, unroped, for the Solvay Hut, where he apparently spent the night. Thence he made his way—"sans se servir des cordes fixes"—to the Shoulder and the summit of the Matterhorn. Here the available reports begin to differ. According to the United Press, he reached the top ahead of a party that had seen him lower down, and then, quite on his own initiative, started the descent to the Italian hut. According to *La Cordée,* an Italian guide found him "miaulant au pied de la croix" and carried him down to the hut in his sack. According to the *Saturday Review of Literature,* he (or, rather, in this version, *she*) started down the other side and *then* was rescued, from a steep rock face, by an Italian guide.* In any case, though there have been many climbing dogs, before and after Coolidge's Tschingel, it remained for this *matou* to accomplish the first four-footed solo ascent of the Matterhorn.

*Wunder der Gletscherwelt.* A report by the *Manchester Guardian* states that Lac Combal, which used to be fed by the Glacier de Miage, on the Italian side of Mont Blanc, has vanished. Visitors from Courmayeur were incredulous. It has been suggested that the waters must have run off, overnight, into a newly opened cavity under the glacier.

A report by the London *News Chronicle* states that Carlo Kosloaski, who stumbled into a crevasse on the Marmolata Glacier in 1915, while he was serving with the Kaiser's Imperial Hunters, has reappeared. In one of the pockets of his uniform, there was a pack of cigarettes.

*From Tawny Spain.* Two climbers from Barcelona, Francisco Marti and Manuel Puig, have reached the summit of Es Vedra, a rock obelisk rising 1281 ft. out of the sea. A Reuter dispatch reports that they started the climb from a motorboat and completed

*Horace Sutton, "Young Man with a Matterhorn," *S. R. L.,* 21 Oct. 1950, pp. 40-41 —a generally bloodcurdling piece that compares the Matterhorn to "Bob Hope's proboscis" and climbing it to "a sort of Russian roulette."

it in two and a half hours, successfully defying a local proverb which says, "He who climbs to the peak of Es Vedra will instantly undergo a change of sex." This is believed to have been the first ascent.

*Museum at Lourdes.* Visitors to the Pyrenees, when they pass through Lourdes, should not fail to visit the museum in the Chateau-Fort. Maintained since 1920 by the Touring Club of France, it is the country's best regional museum. Besides many exhibits of costumes and folklore, the Salle d'Honneur du Pyrénéisme contains memorials of those who, during 150 years, made discoveries and ascents in those mountains—as mysterious, in the beginning, as Central Africa or the Poles. The library preserves the richest collection of Pyrenean books and manuscripts in existence (Ramond, Count Russell, Beraldi, *et al.*). One sees the death mask of Ramond and his scientific instruments, and Russell's goatskin knapsack. On panels are the axes and batons of celebrated climbers and guides, and on the walls are mountain drawings by Hippolyte Chevalier, who came to the Pyrenees in 1825 and there took the pseudonym under which he became famous: Gavarni.

J.M.T.

*The Road to Coire.* This is the story of a pilgrimage which began in Zermatt at the foot of the Matterhorn and ended at Coire, the chief city of the canton of Grisons. The year was 1890, the time midsummer, the length of the trek some 138 miles. Four days seemed sufficient time to allow. While the rest of my party chose to take the long railroad journey by way of Lausanne, Berne and Zürich, the open road seemed preferable to me. Two passes had to be crossed, the Furka and the Oberalp, and the valley of the Vorder-Rhein, with its peculiar charm, explored.

It was Friday morning when I shouldered my knapsack and set out by way of St. Niklaus and Stalden for Visp in the Rhone Valley. After lunch I went on to Brig, five miles farther. Some 27 miles lay behind me. In order to be able to cross the Furka Pass on the second day out, I shortened my journey by taking the Swiss Postwagen that afternoon as far as Ulrichen, a distance of 80 miles. The inn was unpretentious but good and not expensive. To reach the head of the valley the next day was an easy walk of seven miles.

Thence the climb to the Furka Pass, an ascent of 2000 feet, was made interesting by the close-up views of the broad sweep of the Rhone Glacier and its crevasses. Soon after midday I arrived at Hospenthal, found a good hotel and decided to spend the night there rather than at Andermatt, which is usually crowded in the summer months. That afternoon I visited the Devil's Bridge N. of Andermatt. The Reuss falls into a deep gorge here, and towering cliffs above make a most impressive spectacle. Workmen were busy blasting the cliffs to place artillery for the defence of the St. Gotthard Pass.

My second day out had added some 30 miles to my score. Where would my next night be spent? It was Sunday morning and the weather fine when I left Andermatt to cross the Oberalp Pass. Following the long turns of the winding road for six miles, I soon reached the summit of the pass. The ascent was about 2000 feet. From the scenic standpoint the view was disappointing. After a brief rest I pressed on to my goal, the ancient town of Disentis, where the Mittel-Rhein joins the Vorder-Rhein. Thirteen miles lay ahead of me before I could hope for rest and my Sunday dinner. The good folks in the villages through which I passed were attending mass. The churches were open, but the inns were closed until afternoon. I felt in my pockets for a chocolate bar or a crust of bread, all in vain. At long last the Kurhaus at Disentis appeared and, soon after, the table d'hôte dinner. It was followed by a complete rest that afternoon. While I had walked some 21 miles on my third day out, there remained still 36 miles to go if I was to reach Coire for my rendezvous on Monday. Could it be done without the help of the Swiss Postwagen? I hoped so.

As luck would have it, I had the company of a young German on Monday. He volunteered to join me as far as Ilanz, some 18 miles down the valley. The hours passed quickly and pleasantly as we sped on our way. At the picturesque town of Ilanz, high above the Rhine, we had a hearty lunch and enjoyed the good Valtelline wine. I could not persuade the German to go farther, and set forth alone on the last lap of my journey.

The highway led through Flims, Trins and Tamins to Reichenau. The day was well-nigh spent when I reached Reichenau, where I encountered the railroad. I was weary, and finished the last five miles of my trek to Coire on the train. Except for

conveyance by Postwagen and railroad for a matter of 30 miles, I had accomplished my pilgrimage on foot, as is the way of good pilgrims. My reward was a few weeks' stay at Pontresina, in the heart of the beautiful Engadine, and some good climbing in the Bernina Range.

CHARLES F. JUDSON*

## ASIA

*Ascent of Annapurna.* Last spring the French Himalayan Expedition successfully climbed Annapurna (26,500 ft.), the highest summit yet reached and the first peak over 8000 meters ever ascended. In the original planning of the expedition it was decided that the objective was to be an "eight-thousander." This greatly limited the choice, since nearly all the 14 peaks above that altitude lay in regions where entry was impossible because of the India-Pakistan war in Kashmir or the Communist pressure on Tibet. When permission was granted to enter Nepal and either to attempt Gaurisankar or to follow the Krishna Gandaki Valley and try Dhaulagiri or Annapurna, the French decided on the latter region so that they might have two peaks from which to choose.

Study of other expeditions convinced the organizers that most failures in the Himalayas had been caused by a lack of physical conditioning and by too large a group encumbered by too heavy equipment. They therefore joined the school of thought favoring light expeditions. The comparatively small group was headed by Maurice Herzog, and consisted of Jean Couzy and Marcel Schatz with the three guides Gaston Rébuffat, Lionel Terray and Louis Lachenal as the climbing party, Dr. Jacques Oudot as doctor, Marcel Ichac as photographer and approximately an equal number of Sherpa porters. Local porters were used only for the approach march to the mountain. Great stress was laid on physical conditioning, which was greatly helped by the three-week preliminary reconnaissance and the extensive carrying of loads by the sahibs.

The expedition reassembled in Tukacha on 14 May 1951 after having explored thoroughly the possibilities of climbing Dhaulagiri (26,825 ft.), whose N.W. ridge seemed to offer a possible route—

*Dr. Judson, a Philadelphia physician who had travelled widely in the Alps, died in 1948.—*Ed.*

but one which was so difficult that it could hardly be climbed in the three weeks that remained before the coming of the monsoon. Annapurna, some 20 miles to the S.E., had hardly been reconnoitered, although one party had discovered a tortuous way through difficult terrain that appeared to offer access to the yet unseen N. face. The unknown appealed to them more than certain difficulties. The climbers set off, leaving the bulk of the transport to be organized so that it could leave immediately on being summoned. After a day's march on valley roads, they slabbed along the walls of a gorge, across a col in the Nilgiri chain and into the Miristi Kola Valley, which they reached just upstream from some impenetrable gorges. After difficult stream crossings, they established their base camp at about 15,000 ft. In order to get a better view of what lay ahead, they decided to climb the N.W. Spur. The difficulties which the party encountered were extreme; it probably did the most difficult climbing ever carried out above 16,000 ft. Enveloped by clouds as they reached the first peak on the ridge (18,500 ft.), they gave up the attempt. Three days later, on May 21st, they returned and climbed to a higher summit on the spur, reaching an altitude of 19,700 ft. From what they could see there, and from other reconnaissance, they decided that the route seemed practicable and sent back for the bulk of the transport.

Knowing that they were fighting against time, they continued on without waiting for further supplies. Camp I was established on the glacier, and Camp II was set at 19,700 ft. at the foot of the difficult section of the peak. From there to 23,000 ft. the route led up a series of very steep ice and snow slopes, frequently swept by avalanches and badly cut up by icefalls which contained enormous crevasses and séracs. Camp III was placed on the lip of a crevasse at 21,300 ft., and Camp IV was 1300 ft. higher at the upper edge of the "Sickle," a semicircular rock and ice cliff that guarded the approaches to the comparatively easier upper slopes. By June 2nd Herzog and Lachenal established Camp V at 24,300 ft. and at dawn on the 3rd left for the summit, which they reached at about two o'clock. There, in order to adjust his camera, Herzog removed his gloves and lost them. Terray and Rébuffat, who meanwhile had established themselves in support at Camp V, were surprised when Herzog returned alone with badly frozen hands and feet. He had unroped from Lachenal to descend faster. Considerably later, they

heard a cry and saw in the stormy afternoon Lachenal some distance below them, where he had managed to stop a fall. He was badly shaken and minus his ice-axe, hat, gloves and one crampon. He, too, had badly frozen hands and feet. After an uncomfortable night spent in trying to revive their extremities, they realized that the usual afternoon and evening storm was not abating. Feeling that it was unwise to stay in the high camp any longer, all four started for a lower camp. Soon the wind dropped, but it began to snow very hard, and it became impossible to find the route down. At dusk, as they were seeking a crevasse in which to bivouac for the night, Lachenal fell into a hole and found himself inside a shallow, well-bridged crevasse, a perfect shelter for the night. Huddled together with all their feet in the one sleeping bag they were carrying, they spent a miserable night. At dawn an avalanche passed over them, luckily covering them only lightly with snow and not completely burying them. It did, however, cost them a tedious hour of digging for their lost boots and equipment. When they emerged from their shelter, Terray and Rébuffat discovered that they had become snowblind from not wearing their goggles in the storm the day before. Herzog and Lachenal were exhausted and frozen even worse than the day before. Although it had cleared somewhat and the latter two had fair vision, they could not decide what route to take. Just at this moment Schatz appeared some 50 yds. from them, making his way from Camp IV toward Camp V. In spite of the fact that the mountain lay deep in new snow, it seemed essential that the whole party descend as fast as possible to Camp II with the frostbite casualties. Part-way down, the fresh snow, over a foot deep, peeled off, sweeping four of them with it. Rebuffat jumped to the side of the couloir where he was clear. Herzog jumped into a small crevasse, from which he managed to hold the two Sherpas who were on his rope. The battered group struggled into Camp II that afternoon.

The monsoon broke before they reached the main valley, but they won their race with the rising waters. Although transporting the crippled climbers on stretchers was extremely difficult, the whole expedition was soon able to make its way out to India.

ADAMS CARTER

*The Norwegian Expedition to Tirich Mir.* In 1949 two Norwegian climbers, Arne Randers Heen and I, made a reconnais-

sance of Tirich Mir. It was long since there had been a Norwegian expedition to the highest mountains in Asia. In October 1907 Rubenson and Monrad Aas made an attempt to climb Kabru, but had to turn back a few hundred feet from the summit. Since then Norwegian mountaineers have mainly been developing their own fields. There are now a great number of long and difficult climbs in southern and northern Norway which never have been enjoyed by foreigners.

The central chain of Hindukush increases in height from E. to W. and culminates with Tirich Mir, a twin peak, of which the western and main summit reaches 25,263 ft. and the eastern 25,237 ft.

It is a rather isolated peak which can be seen from the valleys of Chitral as a glittering fairy castle 20,000 ft. above the valley floor. Tirich Mir mythology is exceptionally rich and makes it very difficult for Chitral porters to feel at home on its formidable glaciers. They feel haunted by spirits. Also, since they are mostly unaccustomed to snow and ice, pioneers have predicted that, if Tirich Mir were ever climbed, it would be without Chitral porters. Previous attempts on the mountain had not succeeded, partly because of this problem.

In 1949 the reconnaissance party worked without porters from 14,000 ft. and upwards, but succeeded in trying two possibilities. The S.E. Ridge was tried—a formidable rocky ridge which leads to the western summit. From there one has to descend 300-600 ft. to get to the western and main summit. The S. Ridge was also tried: that is, a steep glacier (the "S-glacier," we called it, because of its steepness) was used to get to a point at about 21,000 ft. from which the S. Ridge can be inspected.

Both routes seemed to be feasible—the S-glacier only in very stable weather, however, and even then only at great risk.

A third possibility was not tried out: to climb a protruding rib on the S. walls of the Tirich summit pyramid and get to the upper part of the S. Ridge above the rib. This possibility was left untried mainly because of obvious and grave dangers in case of snowy weather. Avalanches would in that case sweep all the slopes we would have to traverse.

During the winter of 1949-1950 the Norwegian Alpine Club and the Norwegian Geographical Society prepared a major expedition.

Pakistan authorities were very helpful. Five members of the Alpine Club were picked out as climbers; one of them was also to function as physician. A geologist and a botanist joined our party, and also two photographers. Two residents of Pakistan joined us as liaison officers, the one a Pakistan mountaineer, the other an English captain of the Chitral Scouts.

On June 11th we arrived at the S. Barum Glacier, a 15-km. glacier leading to the S. and S.E. walls of the Tirich Mir summit pyramid.

On June 29th the S.E. Ridge was inspected at about 20,000 ft. The steps on the very steep rocky edge were covered by deep snow which would take weeks to melt. This ridge was therefore given up, at least provisionally; and we tried out the second possibility, the S-glacier. During the inspection from Camp 5 at about 19,000 ft., extraordinarily heavy ice avalanches swept the upper part of the S-glacier. So far our camps had only been struck by storms created by ice avalanches from the walls of the Tirich pyramid. Along the steep, concave S-glacier, with its ice towers and great number of icefalls, we were very likely to be hit by the ice avalanches themselves, and we therefore also gave up our second possibility.

On July 6th we began to attack the summit pyramid along the protruding rib mentioned above. We called this the "third route." Weather was perfectly stable, and the sun had made the snow very secure—but exceedingly deep and loose. As long as these conditions lasted, the third route would be practicable and safe; but it was quite clear that in case of change of weather complete disaster would threaten. We accepted this risk.

From Camp 6 at about 20,500 ft., a first attack on the summit was made; but a porter got a fit of insanity, and threatened to jump into the abyss, carrying others with him. The next day was used to arrange transport for the victim. The two climbers did not give up, but tried to reach the summit without porters. They did not reach higher than 22,700 ft. and returned rather exhausted, having carried much too big loads.

On July 20th a second attack started from Camp 5. Three porters were able to go with us as high as 23,000 ft., but unhappily they felt so badly in the mornings that they refused to start before the sun was warm. At that time snow crusts melted, and this made transport exceedingly heavy. We reached the S. Ridge in

two parties, and the main party constructed a last snow cave, Camp 9, at 23,300 ft. One climber who reached the S. ridge in front of the main party got time to reach the summit next day, July 22nd. The next day the three other climbers reached the summit—one of them, the English captain of Chitral Scouts.

The S. Ridge from 23,300 to 25,263 ft. took us 10-11 hours and it was as late as 6.00 P.M. when we arrived at the summit, the main party with film camera.

The scenery from this lonely giant mountain is tremendous. One can look into Afghanistan, U.S.S.R. and China. Nanga Parbat, the Karakoram and the Pamirs are all within sight.

Weather continued stable, but in the mornings we were not far from being frostbitten. One climber developed pneumonia at Camp 6 (20,500 ft.), but recovered rapidly by help of penicillin.

A few days later we were all in good condition down at the snout of the S. Barum Glacier. Some were not quite able to walk because of slight injuries by frost, but after some weeks all traces of mishap were gone. Even the porter who had the fit of insanity was perfectly restored to health.

The men on the great French expedition to Annapurna experienced worse things. Luck plays a great rôle. We had fine stable weather to the end; the French did not. It should also be remembered that the risks of bad weather are greater in Nepal than in Chitral. Our "third route" would probably have been deadly dangerous in the monsoon climate of Nepal.

ARNE NAESS

[We are indeed grateful to Professor Naess for sending this account of the expedition which he headed.—*Ed.*]

*Nanga Parbat.* Two men were lost and the third suffered frostbite during an abortive attempt by three Englishmen to climb Nanga Parbat in December 1950. Full details are lacking, but *The Listener* quotes the survivor, Richard Marsh, as stating, "The temperature hovered around the zero mark, and after a week I was suffering from frostbite and had to return to base camp. I left my two companions at 16,000 feet. They said they were going to see how far they could go without taking any big risks . . . On December 1 I watched them pitching their tent at a height of about

18,000 feet . . . Then a blizzard came down, and when it cleared there was no sign of the tent . . ."

*Bandar Punch.* On 20 June 1950 the first ascent of Bandar Punch (20,720 ft.) was made by a party including a school principal, a major general, a teacher and a sergeant-instructor. Seven or eight attempts to climb the peak, which can be seen from Mussoorie, have been made since 1937. This was the third assault by J. M. Gibson, Principal of the Joint Services Wing of the National Defence Academy. He was unlucky in not reaching the summit on the day when it was attained by Sgt. Greenwood and Tensin, one of the outstanding Sherpa climbers. Greenwood admitted afterward that on top "he felt exhausted and quite unable to carry out his promise that if they ever succeeded he would do a hand stand on the summit."

*Sherpa Love of the Mountains.* Charles S. Houston has made available a letter from the wife of Angtharkay, famous Everest Sherpa, to Major H. W. Tilman, who had written asking for Angtharkay's services. Part of the letter follows:

Lama Villa
Bhutia Busty
Darjeeling
October 20, 1950

Dear Respected Sir:

I am glad to know that you are going to Solah Khombu which is our birthplace and I am well acquainted with the places you want to visit. In Solah Khombu district there is a place called Namzay Bazar, from where it will take you at least 3 days to the foot of Mt. Everest. On the way you will find places called Tengbuzey, Pangbuzey, Dingbuzey. In the first two places big monastery and very sacred places are found. These Buddhist monasteries are governed by Lamas of very high standard of spiritual advancement. Dingbuzey has nothing but sceneries and sceneries all around, and it is told that the beauty and grandeur are simply marvellous and enchanting. I have actually been to Tengbuzey and Pangbuzey and these are the nearest places to Mt. Everest from where one can get a clear view of it.

But I am very sorry to let you know that my Husband Angtharkay has already been engaged by Mr. Marshall or else he would have much been pleased to accompany you to Solah Khombu, his birthplace. I am really very happy that you are

visiting places where we passed our childhood and happier days. I wish I were a man and not a woman to accompany you to those darling darling places to see with my own eyes those hills where we often played a childish hide and seek game with much frolics, and those snow-capped hills and yonder mountains where our eyes never got tired of looking at the Majestic beauty of those mountains. When you reach those places, my dear Sir, do please remember us, and think in your mind that your Angtharkay and his beloved wife are actually with you to show all that they could possibly do in their power to be as much helpful as they would be . . .

Again Sir with my very kind wishes from

Yours ever

Wife of Sirdar Angtharkay Jee

Dr. Houston writes, "If anyone familiar with the Sherpas has any lingering doubts as to whether or no they appreciate the mountains, this beautiful and moving letter should effectively dispel them."

*Everest.* In July 1950 a Bombay newspaper reported the arrival of a Swiss party intending to attack Mt. Everest, but no further account of this group has been received.

Reports of the terrible Assam earthquake and flood tell of 20,000 to 30,000 square miles being affected, with hundreds of villages inundated and 5,000,000 people made homeless. "Whole chains of mountains seem to have vanished," says the Associated Press; and a special dispatch to the *New York Times* announces that Everest has risen 198 ft. and is now 29,200 ft. high. Since the height of Everest has long been given officially as 29,141 ft., the accuracy of this statement about the shake-up can be questioned.

A Peiping magazine, *Open Minded Youth,* strongly urges that Everest be called Chu Mu Long Ma, which is Tibetan for "Mountain of the Waters of the Sacred Mother."

*The Bear that Climbs.* Russian climbers who made the first ascent of a 15,770-ft. peak in Russian Turkestan promptly named it, according to a midsummer dispatch from Tass, for the Chinese Communist leader Mao Tse Tung.

Russian explorers have reported a hitherto unknown mountain range in eastern Siberia near the source of the Indigirka River, in an area long considered to be in winter one of the coldest in the

world. This range is said to be 90 miles long and 45 miles wide, and to include peaks over 9000 ft. high.

Three special dispatches from Robert Trumbull in New Delhi, printed in the *New York Times* on 22-24 November 1950, described recent Russian surveys apparently intended to facilitate establishment of air bases in western Tibet.

*Indian Mountain Division.* Reports from Berne announce that two well-known Swiss officers will act as instructors for the Mountain Division of the Indian Army in Kashmir; also that the Deputy Chief of Staff of the Swiss Army has been invited to India to give a series of lectures to the members of the Indian General Staff.

*Mt. Hermon.* Mrs. V. Z. Lotowycz writes of climbing Mt. Hermon (9232 ft.), a mountain of both archaeological and historical interest, on the borders of Syria and Lebanon. She reports: "The summit consists of three peaks which rise from a small plateau, the 'Hermonites' of the Bible. The true summit peak which rises very sharply is crowned by a stone man and the entire peak circled by huge stone blocks. How they were dragged up there, by whom and why, no one knows. It was probably done by Baal worshipers. The blocks are certainly pre-Roman and pre-Christian. The ruins of a small temple and a cave with a carved stone entrance are also on the summit. Other ruins can be found on the slopes."

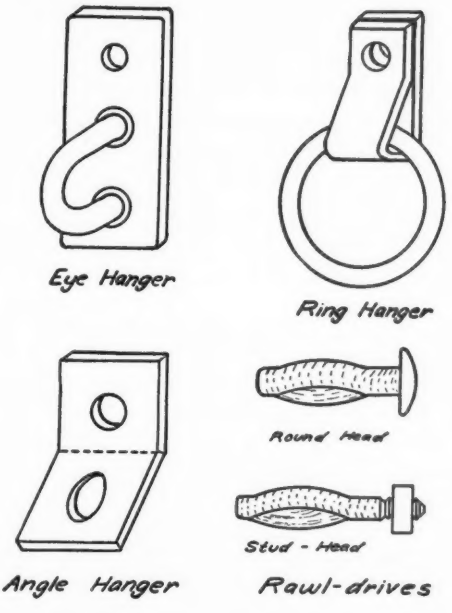
## Equipment

*Rawl-Drive Climbing Anchor.* In recent years, some of the climbers in the Northwest have begun carrying and using rock anchors as standard equipment in rock climbing. Usually the anchors have been used either for safety or for direct aid in situations where natural aids or piton cracks are not available, but recently the use of anchors has come to be regarded as practical even in some places where pitons could have been employed. This procedure can be adopted because the anchor is superior in strength and reliability to most other aids.

At present there are many types of rock anchors available, and several which have been or are being used in rock climbing.[1] A

[1]A. Nelson, *Sierra Club Bulletin,* XXXIII (March 1948), 103; R. Widrig, *Mountaineer,* XXXIX (Dec. 1948), 55; "Contraction Bolts," *A. A. J.,* VII (Jan. 1949), 230; C. Wilts, *Sierra Club Bulletin,* XXXIV (June 1949), 123.

survey of several types, considering cost, weight, strength and foolproofness, led to the decision that the Rawl-drive anchors, manufactured by the Rawl Co., were very practical for rock-climbing purposes in most types of rock. Like most of the commercial anchors, however, Rawl-drives require a hanger before they can be used to hold the karabiner or rope slings. Therefore, the two features that one must consider in preparing anchor equipment are, first, the diameter, length and type of Rawl-drive and, secondly, the construction of the hanger.




Rawl-drives used in rock climbing would probably fail (1) by shearing or tearing in two by forces normal to the shaft or (2) by forces pulling the Rawl-drive out of the hole in the rock. In this latter case, the strength of the rock would probably be the controlling factor and would determine the length of the anchor required. Usually, however, the large forces produced by a fall would be approximately parallel to the rock or normal to the

shaft—which would determine the diameter of the anchor necessary.

Although most of the work on Rawl-drives has been qualitative, Porter Varney reported that a ¼-in. Rawl-drive tested for Charles Wilts failed at 3520.[2] Other tests by Mr. Varney, using 5/16-in. anchors, gave no indication of weakness in forces applied either normal to the shaft or at an angle of 30° from normal up to 3350. These tests, along with the many qualitative tests made in the Northwest, seem to indicate that the use of ¼-in. Rawl-drives is satisfactory for direct aid and rappelling and on the borderline for safety purposes, and that the 5/16-in size is satisfactory for all general uses.[3] Quantitative information is lacking, however, for the specific applications. The chance of material flaws and metal upsets due to pounding limits the absolute reliability of any result.

Recently, the use of stud-head Rawl-drives has been adapted to some extent. These have two distinct advantages over the round-head type. First, the stud-heads allow removal of the hanger, making the hanger cost and weight less important. Second, they allow the hanger eye to fit snugly over the shaft of the Rawl-drive, thus giving an even distribution of the applied forces over the surface of the shaft.

In designing the hanger, one must consider cost, weight, strength and transmission of the applied force to the anchor. Usually the optimum design is obtained by some balance of these features along with the type of Rawl-drive employed. A good illustration is the angle hanger vs. the eye or ring hangers. The cost of the angle hanger is low, but its tendency to lever the anchor out when the force is supplied is very undesirable. The cost of eye or ring hangers is higher; but the transmission of a force parallel to the rock would be very close to normal to the shaft of the Rawl-drive. Probably the angle hanger would be satisfactory with the round-head Rawl-drive, and the eye and ring hangers better with the stud-head anchor, since removal would be possible.

Although these hangers have been constructed, no strength information is known, so actual dimensions will not be reported ex-

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[2]Letter from Mr. Porter Varney, Equipment Testing Association, P.O. Box 1507, Santa Barbara, Calif.

[3]R. M. Leonard and A. Wexler, *Sierra Club Bulletin*, XXXI (Dec. 1946), 68-100; A. Wexler, *A. A. J.*, VII (1950), 379-405.

cept to say that 1/8-in. stock was used in most cases. Some 1020 mild steel was used in preliminary work, but the most recent constructions have been made with stainless steel.[4]

P. SCHOENING

*A New Insulation Technique.* The difficulty of insulating the body against cold by use of woollen or down garments has always been that, as the insulating medium got damp either from body moisture or from outside moisture, its insulating efficiency was greatly reduced, and the moisture itself absorbed a great many calories of body heat. When an attempt is made to repel outside moisture by use of rubber outer garments, the difficulty is often compounded by condensation of body moisture inside to a degree greater than the outside moisture repelled. At times it seems that there is simply no way to keep the insulation dry.

The Army has developed and tested a simple solution to this problem. The idea is to use two vapor barrier layers, one on the outside of the insulation to keep outside moisture out, and one next to the skin to keep body moisture in. Thus the insulation stays bone dry, and socks and insoles worn days at a time are as dry and fluffy when removed as when first put on. For this information, I am indebted to Dr. Paul Siple.

For the past year and a half experiments have been going on in an attempt to find practical ways and means of utilizing this technique with ordinary mountain-climbing equipment. Since the body can usually take care of itself, the experiments have been confined, for the time being, to the hands and feet. For the feet, two very thin plastic bags were used. Because the plastic is rather uncomfortable right next to the skin, the first layer is a very lightweight women's nylon anklet sock. Then comes the first plastic bag, then the regular heavy wool sock (or socks and insole, if necessary), then the second plastic bag, and last the boot. The inner nylon sock of course becomes soaking wet, but being thin and of nylon it is very easily dried out overnight. The plastic used for the bags is so thin and slippery that this combination can usually be worn with no change in boot size. Although the bags must be

[4]Nelson, *op cit.*

folded and bunched up to fit the foot, no discomfort, even for people with tender feet, has been experienced, owing again to the thinness and slipperiness of the plastic. The only difficulties experienced to date have been that the foot may work its way through the seam of the outer bag, and the inner bag work down under the foot—which is not uncomfortable, but destroys the inner protection. No doubt the seam-splitting can be overcome by improved heat sealing methods. The creeping can be overcome by wearing eight-inch-high boots; rolling the tops of both bags and socks down to the boot top and pinning them all together; or eliminating the inner nylon sock and allowing the plastic to stick itself to the skin.

In winter, at temperatures as low as 20° below zero F., the advantages of this technique are easily appreciated. After skiing four and a half miles, one can stand around for 45 minutes without getting cold feet or hands. Of course, it must be remembered that, no matter how good the insulation on hands and feet, they will not be warm if the body itself is so chilled that it can not spare enough blood to circulate heat to the extremities. In summer climbing the advantages are worth while only for snow or glacier work, in which, after a day of walking around in slush and melting ice, the feet can become thoroughly chilled with only the ordinary protection. With this method they stay comfortably warm. Of course, anyone who finds wet socks uncomfortable can use the method regardless of temperature.

The use of this technique with standard mitten shells and liners is slightly more complicated, owing to the necessity of occasionally removing the mittens. It proved very discouraging to try to manage shells, two plastic mitts, two liners and an inner absorbent mitt. The shells, outer plastic mitt and two liners were therefore pinned together at the cuff, making one unit; the absorbent mitt was discarded, and the inner plastic mitt pulled on next to the skin, after which it was very easy to slip into the rest. For most purposes the plastic mitt need never be removed from the hand when the mitts are removed because it sticks in place and is thin enough not to hinder the sense of touch.

This technique is still in only its first stages of usefulness, but present results are so promising that it can already be used to advantage in preventing discomfort and frostbite in exchange for

a little practice in mastering its use. Anyone interested in trying it can write to me for more information or just take it from here. In either case, results and improvements will be of interest.

G. CUNNINGHAM

[It should be noted that the U.S. Army considers this process to be still in the experimental stages, and that it does not at present recommend the technique here described.—*Ed.*]

ERRATA

*Glacier Peak.* In an editorial comment introducing "The Ascent of Glacier Peak" by the late Thomas Riggs (*A.A.J.*, VII, Jan. 1949, 160-64), the altitude of the mountain is listed as 10,436 ft. A letter from Robert R. Coats, of Cabin John, Md., points out that there are two Glacier Peaks in the Cascade Range of Washington, and that Riggs undoubtedly climbed the more northerly one, which is two miles S. of the international boundary and 8994 ft. high.

*François de Ribaupierre.* The name of the Swiss painter mentioned in the note appended to the memorial to Mrs. Colt (*A.A.J.*, VII, Sept. 1949, 329) should be—as Marjorie Hooker, of McLean, Va., has pointed out— François de Ribaupierre, *not* "Ritanpierre."

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